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CONTENTS

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by William Winter

▶ Announced in the last issue and detailed in this month's AMA News, the 22nd Nationals holds special significance for MAN which, in 1933, sprang into the breach by sponsoring the big meet at Roosevelt Field, N. Y. Until then, the old AMLA, headed up by Merrill Hamburg (still an AMA member), had put on the annual contest. But about that time the depression knocked the props from under many things.

Putting on a Nationals in those days was comparatively easy. (165 entrants, two days.) No gas so, of course, no free flight or U-control. Just rubber and indoor was the fare for many years. Carl Goldberg just missed 20 minutes in indoors. That year was the second Nationals appearance of Maxwell Bassett (now a wheel at Martin) with his Brown gas engine and this time they had to change the rules. Bassett won both the Mulvihill and the Texaco trophies.

▶ From that day to this the Nats have grown like a postwar suburb. The miracle is that we modelers have been able to put on the affair year after year. Personal sacrifice and outside help are taken-for-granted ingredients. At Los Alamitos last year leading coast modelers gave up their own right to fly, invested their vacations, and practically slept on their feet. There is no one to underwrite the NATS, no one to rub the magic lamp for the things we need. As this is written on Thanksgiving Eve, the work on the 1953 Nats is already begun, but there are never thanks from some modelers who apparently see only the worst of everything. They object to Plymouth, the Navy, the AMA, the way the Nationals are run, and even the fact that some modelers prefer other types of flying. Are we forgetting that modeling is supposed to be fun? That modelers are supposed to be friendly? That any friend of modeling is a friend and not a saboteur?

▶ Out in Tokyo, Dallas Sherman, reading a recent column lamenting the disappearance of flying sites, and the unsuitability of present contest type free flight designs for everyday flying, was inspired to propose for discussion a set of rules which would limit duration, and consequently, the size of the necessary flying fields. Dallas, as you know, is righthand man in the Orient to PAA's President Juan Trippe. What matters to us is that Sherman is a modeler from way back and the originator of the PAA Load events.

"It seems inevitable to me that if free flight planes aren't tamed to stay where they belong (i.e. inside the designated flying areas), then it won't be too long before they will not be allowed to fly from those areas," states Dallas, ". . . if they aren't tamed to fly within reasonably restricted areas (as can be found in or relatively near cities), then free flight is due for slow but certain death from non-activity. From our PAA point of view, it would deprive us of the most applicable educational channel to the youth of our air age."

▶ All this is subject to several big IFs. We modelers (*Continued on page* 8)

PLANE ON THE COVER—NIEUPORT 11

With the Nieuport 11 World War I French fighter on this month's cover, Jo Kotula begins a new series of paintings of famous planes of history. The incendiary rockets are not make-believe. Shots of this same airplane in our W. W. I picture archives show them clearly. With all-rocket fighters now the vogue, history repeats itself. We invite our readers to send us the name of their all-time favorite. Future subjects will be picked accordingly.

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Scrap ... Box

by Jim Saftig

Raspbuckniks are what we need more of, claims Jim, for sending more guys to the Nationals. He shows how to raise them, too.

Up Montreal way, Cliff Morris reports the number of contests has dropped off but the quality has gone up tremendously. The Juniors are giving the old men plenty of trouble. Free flight has the upper hand. U-control boys fly for kicks but the contests don't seem to be a lure. One well organized meet scared up about eight entries from the city and about fifteen entries from out of town—tsk, tsk. From our observations this appears countrywide. Rubber flying is on the upswing again and the Montreal *Sleepless Knights* are hoping to have a Wakefield eliminations in '53 at the home port.

* * *

The Cleveland *Balsa Butchers,* one of the top pre-war model clubs, recently broke loose and threw a meet. Their Fall Wakefield Contest will be an annual event. Got a kick out of one of the names on the winner's list—Dick Korda. Interest in the rubber category has long been high in the club and led the recent revival. Former members placed one, two, three, four at the local Wakefield eliminations last spring but didn't do too well at the semi-finals. At the Akron inter-city Wakefield a few weeks ago, they knocked off the individual high time and the team (combined times) event. The club is perpetuating the memory of one if its early members through a C. B. B. Edward Deemer Memorial Trophy to be awarded annually. Deemer, a RCAF Flight Officer, lost his life in World War II as a pilot of a Lancaster when he was shot down over Holland. First winner of the award was Matt Basta. Mrs. Anne Deemer, Ed's mother, presented the trophy.

* * *

According to the *Skycat Tail Twister* blurb from the Salem, Oregon gang, everyone is dusting off the drawing boards again for a crack at next year's hardware. Quite a few of the older members are dropping by the wayside and the younger element is needed to bolster club rosters. The club "wheels" had better make the programs interesting and educational or they will end up defunct as many other clubs have. This is no curve at you, Skycats. You boys seem to be on the ball. We were looking in our own backyard.

* * *

Speaking of clubs that click, one of the best organized outfits is the *Western Associated Modelers.* The Robbers family is in there pitching all the time. Much good information is given in club minutes. One of their motions got us going: "This motion is to delete the present rule on AA Stunt competitive grouping and to adopt the following rule: Flight scores made, and places won, in the AA Stunt Event shall be used for the purpose of advancing stunt fliers in the competitive stunt flying groups the same as in classes A, B, C, and D. The AA Stunt Event shall be a regular stunt event the same as classes A, B, C, and D, but may be held in two competitive group combinations—Combined Novice and Beginner Group and the Combined Advanced and Expert Group. (Purpose of this rule is to stimulate interest in this event by having a means of advancing consistent winners into higher competitive groups). Under the present set-up we are unable to move them along." Like to see the small stunters get a break. In our book they're tougher to fly but a heck of a lot of fun.

More than a bit interested in the last contest results from Mom Robbers pertaining to the *Sky Jockeys* of Vallejo meet. Herm Shiman, one of the *Aero Modelers* of Alameda, turned a fat 158.60 with a McCoy 65. Mom, was this a misprint or has Herm opened up a standard Mac to the quoted bore? Whether it be a 60 or 65, that's turning, Mr. Shiman.

* * *

A bit of "poop" from Kontest Kapers of Model Makers by "Gorrie," otherwise known as Arthur Gorrie. Always glad to hear from you Australian fliers. We're a bit late with the news of the North Coast of New South Wales Championships (that's a mouthful). Seems that everyone gets together to tour to a meet and the meetings promote plenty of chuckles. Main beef seemed to be the ancient transportation giving up in the middle of the run. Our interest is up per Don Adams, of Childers. Seems this keen flier has a modified *Fledgling* R/C job powered with a Frog 150 that does the business. Seventy to 80 times in the air with nothing but good results. His new dream ship is a Lavotchkin (you tell us?) for his Frog using a ducted fam principle as expounded in M.A.N.

Here's a good deal for the N.M.A.A. gang. The top scorers, six in all, in the series of contests to be held throughout the year, get a bid to go to the Australian Nat's and will be subsidized to the extent of ten pounds for traveling expenses or as much as the club can manage. Here's a deal that should catch on in the states among the larger clubs with a fatter bank roll (wonder how many clubs have a fat roll?). While we're on the subject of cash for the Nat's, seems like a good deal to work out throughout the states. At the present time, the Nationals are to held on the East Coast, Midwest, and the West Coast again. For real, and the deal sounds solid, why couldn't a big elimination meet be held (or a series of two or three) to pick a team from a given area to be sponsored to a trip to the Nat's. A "trek" from California, Oregon, Washington, or other western states to the east coast takes a bit of the green stuff. Let's take the west coast. An eliminations could be held at Los Angeles or even San Francisco, another in Washington. Flyers from Oregon and near states could compete in the Washington eliminations, and areas adjacent to California could get together for the California "free for all." Getting to sound like a Plymouth plan, which is plenty fine, and see no reason why it wouldn't be whole heartedly supported by the modelers. Everyone likes to take in a Nat's, and the extra money would help supplement a family vacation for the winners.

Here's the way it could work. Every club has a few "hot shot" fliers. It would be up to the clubs to hold a local elimination meet to pick the entrants for the big eliminations in the area designated. The club would in turn sponsor the entries. Say it would cost five dollars to sponsor one man. Most any club could get the 25 or 30 bucks to send the five or six man team. Sure, if one of the fliers had a tough break and didn't make the grade, he could sponsor himself to the eliminations and try to win the big award—a trip to the Nat's. The more entries, the more money for the winners. There are plenty of club members in the areas who would help run a meet of this magnitude, and we're sure that members of the industry would get in and help as they always have. So we hold the wing-ding after the entries are in, the raspbuckniks could be counted and the number of final winners could be figured per amount received. Of course, an amount would have to be given that would make up for the traveling expenses, etc. With the number of clubs and fliers who would undoubtedly sponsor themselves, the amount should be quite a tidy sum. Let's go a step further—if the amount didn't come up to expectations, and we don't see how it could possibly miss, then the winners of the northern area and the southern area group get together, making sure that the per capita amount permits the competition, and a last big eliminations is held with the spoils going to the final winners. It looks from here as if there would never have to be a big final eliminations between the north and south as the idea should catch on, or are we being smug? Throughout the midwest and other states like contests could be held to get the winners on the road to the Nationals. Of course, one advantage of the midwestern area is that the fliers wouldn't have as far to go and the "coin of the realm" would send more fliers to the meet with some of the expenses paid. How many times have we heard it said "If I just had a few more dollars, I would take in the Nat's this year." Sure, lots of details would have to be worked out but think of the results. More meets around the country and more fliers getting a chance to go to the Nat's. What do you think about the deal?

Kinda got off the track on the Australian News but the roots of the idea originated there so had to let it fly.

* * *

At the recent 1952 Royal National Control Line Championships, at which 20,000 spectators came back nightly for six nights in a row, a new speed pilot took the limelight. Ted Ward, the existing State Jr. Stunt Champ, established a new Queensland record of 113.88 mph. Young Ward, using a Dooling 29, was the first person in Queensland to fly over 100 mph officially. Team racing has taken over in the circles in Australia and a lot of sharp ships are flying. Keith Muhling clipped the rest of the fliers in the "B" ten miler and Ron DeChastel knocked off a fast 100 laps to take the Australian National Airways Trophy. The sixth Australian Nationals will be held at Bendigo. Contestants will be billeted at the showgrounds where the control line events will be held. Free flight events will be at Raywood, which is 21 miles out from Bendigo, and has 2000 acres of clear flat ground. Imagine!

(Continued on page 44)

Conrad Connrod
AHHHH THIS IS THE WAY TO GO TO A CONTEST...
...UP AT THE CRACK OF DAWN, GOOD BREAKFAST, RESTED, — MODELS DONE AND TESTED, BIRDS SINGING... BEAUTIFUL DAY, CONRAD, YOU'RE FRESH, ALERT, YOU CAN'T LOSE.....
WHY EVEN THE CAR IS RUNNING SMOOTHLY, THINK OF ALL THE POOR TIRED GUYS THAT STAYED UP ALL NIGHT --- NOT FOR ME ANYMORE —
I MUST BE DREAMING! EVEN THE CONTEST COMMITTEE IS ON THE BALL, ROAD SIGNS AND EVERYTHING, AND WHAT A BEAUTIFUL DAY
CONTEST→
A 21 944
HERE ALREADY... NO HITCHES, NO TROUBLE, NO GETTING LOST, AND I'M THE FIRST ONE HERE —
CONTEST
TOOL BOX, LUNCH, ENTRY FEE, MODEL — NOPE DIDN'T FORGET A THING
OH MY NO, MR. CONNROD YOU SIT RIGHT THERE, I SHALL TAKE CARE OF YOUR REGISTRATION AND SEND A TIMER OVER AT ONCE - NOW JUST BE COMFY..
HOT DOG!! IT'S HOOKED A THERMAL!!
I CAN'T SEE IT ANYMORE
OH I CAN - IT'S TURNING... YES! IT'S COMING BACK!!!
TIMER
OH IT'S NOTHING — ANY RED BLOODED AMERICAN BOY COULD HAVE.....
CONNIE!! WAKE UP! FINISH THAT WING - LET'S GET GOING, IT'S ALMOST DAWN
Bob Godden

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Man at Work

(Continued from page 2)

are notoriously touchy about radical alterations in the rules. In some sections of the country, flying sites are not a problem and spokesmen from those areas will be slow to understand the predicament that hamstrings other sections where free flight is now almost a thing of the past. Many people will never sell out the hot climb and long glide. Even if we were of a mind to change the rules, the earliest possible date would be two years hence, when such matters are again voted on. Dallas himself puts it this way . . ."to determine whether or not the majority is ready to recognize the seriousness of the problem and to solve the problem by accepting new type models with performance restricted by additional weight, strength, and realistic constructon and detail; which type models may flown safely in contests in more restricted areas near cities."

▸ Suggested is a maximum displacement of .29, with classes AA, A (top .099), B (top .199) and C (top .299). Minimum weight should be respectively 10, 20, 40, and 60 ounces. Maximum total span (wing and stabilizer), 60, 75, 90, and 105 inches. Cabin cross section minimums: 2 x 4, 2 x 4, 4 x 4, and 4 x 4. For PAA Load, five ounce dummies would be carried, one in AA, two in A, four in B, and six in C. Thus, gross load (PAA Load only) would be 15, 30, 60, and 90.

▸ Reaction to these interesting suggestions will be many and varied. People who have seen the rules don't agree on details or implementation, but basically like the proposal. MAN at Work put in three days of pencil work, concluding that someone may have built such test machines for the figures certainly are not just grabbed out of the blue. For example, a Half-A PAA Load under these paper rules would approach a Cargo Clipper in weight, yet would have better performance. A .19 job with dummies is approximately equivalent to existing lighter radio jobs, many of which can snag thermals when free flighted, some even disappearing out of the top when under radio control. But, while approaching rc's in size and weight, performance would be better than an rc is capable of. After all, dual designs like the *Brig*, can be built to the same weight for either rc or payload under present rules. If the added weight of the proposed models implies danger, it should be considered that a Cargo Clipper, the ultimate in high loadings, is as near harmless as a plane can be built.

▸ MAN at Work doubts that the majority is now ready to accept such innovations, but hopes PAA would be able to institute such an event in their own rules for 1954. At least an .049 and a .199 top in two classes would be an excellent starter. But opinions should not be hazarded at this stage. One point not to be missed, is that the minimum weight would have a radical and, to us, a desirable effect on structures. A parallel case would exist if a maximum weight were put on Wakefield motors, which would have the effect of creating more durable structures, an illustration not to be construed as a recommendation. Skill would be required more in designing than in chasing, with more emphasis on the plane than on the chaser's athletic condition and the timer's eyes, and with less of an element of luck in snagging thermals and getting back undamaged (if at all) a ship for those second and third flights.

▸ Rumors and rumors of rumors are going the rounds about the FAI's plans for international contests. It is to be hoped that plans are being made for a centralized location for the Wakefield, Nordic, U-control, and International Power Contest (F.F.) to be held simultaneously and to which various countries will be better able to send a team. END

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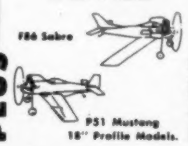

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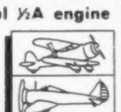

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Wheeler's (England) model, displayed by proxy flier S. Lanfranchi of the British team, had the top duration at Zurich with a total of 807.6 seconds. More interesting features include a skid type landing gear and a side mounted diesel. Like the U. S., most British free flight models favor an all-out climb.

Retrieving is a must for any championship contest. Over there, it's called the "model finding service," and it's done by the Boy Scouts who apparently get a big charge out of the whole business.

Swiss—and most continental designs—lean toward a maximum glide with power a secondary consideration. Such ships usually are shoulder wing, high aspect ratio jobs. H. Lauchli won the 2nd place.

The International POWER CONTEST

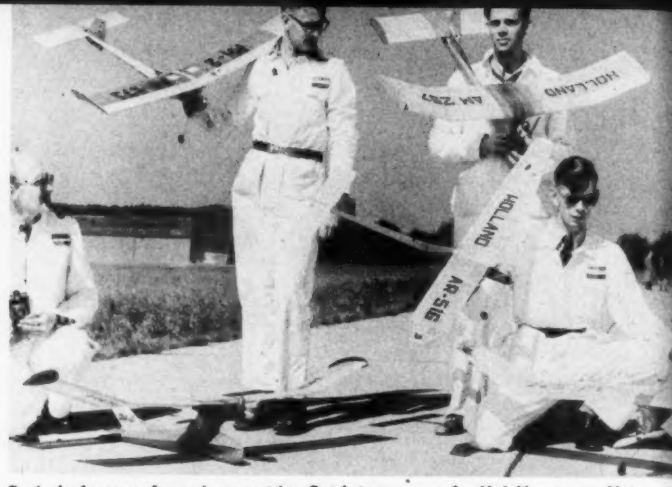
by RICO W. NEIDHART

Wheeler, Britain, is new world champion in free flight; Swiss the top team. How would United States stack up in this crowd?

The international contest for power model planes took place on a military airfield in Zurich, Switzerland, on September 13 and 14, 1952. This important contest was attended by 42 model fliers with 76 models from England, Germany, Austria, Belgium, France, Holland, Italy, Yugoslavia, and Switzerland.

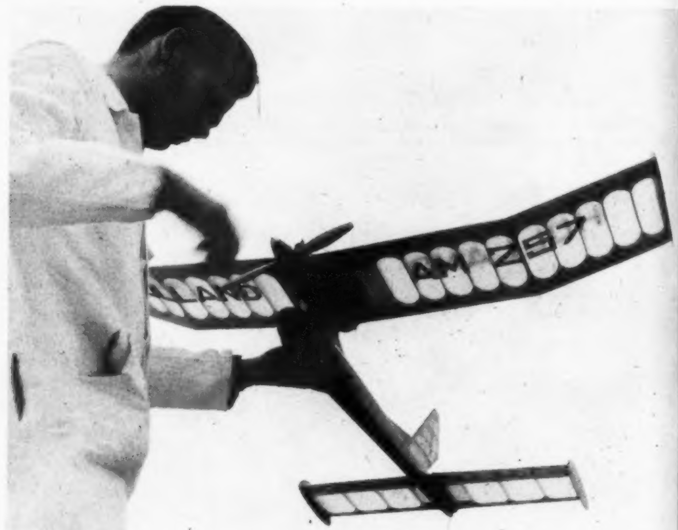
Owing to the absence of extra-European countries, particularly of the United States, this meeting had the character of a European contest only. One may wonder why a team from the U. S. A. came over for the Wakefield Cup, while no American representative attended the Swiss meeting? According to numerous inquiries, many more gasoline power

R. Bacchi, Italy, and his 19th place winning ship. Enclosed engine, wing junction, fuselage lines, denote attention to detail.



Typical of groups from nine countries, Dutch team poses for M.A.N. camera. Note job, lower left. Forty-two builders flew 76 models in meet that was success.

Fifth place was taken by this potent looking plane by D. Prohaska, Yugoslavia. Swiss winning team shaded Germans by 27 seconds.



More ingenuity is shown by variety of designs than in present American contests. Ch. Kempen, Holland, cranks diesel on his 12th place winning airplane.

Top ranking German, G. Rupp, took sixth. Since America attended the Wakefield, Swiss hosts wondered why U. S. missed f.f. meet.

Graceful, birdlike lines distinguished 11th place winning design, G. Skalla, top man of the Austrian team. Austrian models in general are highly developed.

models than Wakefields are built and flown in the U. S.

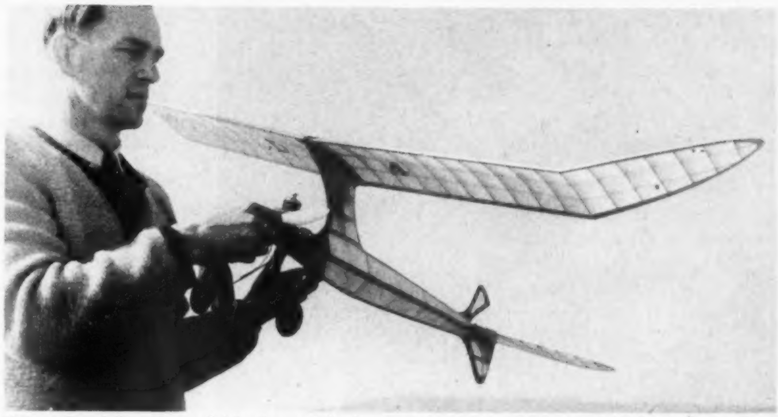
Nevertheless, the 1952 contest was a complete success from the point of view of attendance and of performances attained, as well as of meteorological conditions, which proved excellent.

As regards individual results, a British victory was won by Wheeler, whose model was flown by Lanfranchi, chief of the British team. For the first time, a model flier was proclaimed a world champion with flights made in "proxy." Wheeler and Lanfranchi are both to be congratulated for their performance.

Classification by teams showed a hot struggle between the German and the Swiss teams, the latter finally winning with two of its members ranking second and fourth.

The contest was governed by FAI rules, which limit the running time of the motor to 20 seconds and the total chronometer-recording time to 300 seconds. Due to this fact, all models were equipped with a dethermalizer. Timers for stopping the motor consisted for the great majority of automatic releases, well known to amateur photographers. The increase in weight was acceptable by a good margin, as the rules require that the model weight be at least 200 times the displacement of the motor expressed in cubic centimeters and grammes. A much greater security was thus obtained, and many models flew with their motor running for 19 seconds, thus attaining a maximum height.

From the technical side, the meeting opposed two building theories, as was the case in Paris *(Continued on page* 47)



Unique fin of German model by Leppert, had cut-out to permit stabilizer pop-up for dethermalizer; also served as stop. Note the odd pylon structure and the placement of major fin area under fuselage.

Good example of Swiss, Belgian practice, shoulder wing by H. Schnabel that won fourth place for Swiss. Features knock-off wing panels, simple structure, generous down thrust for straight ahead climb.

TEAM RESULTS

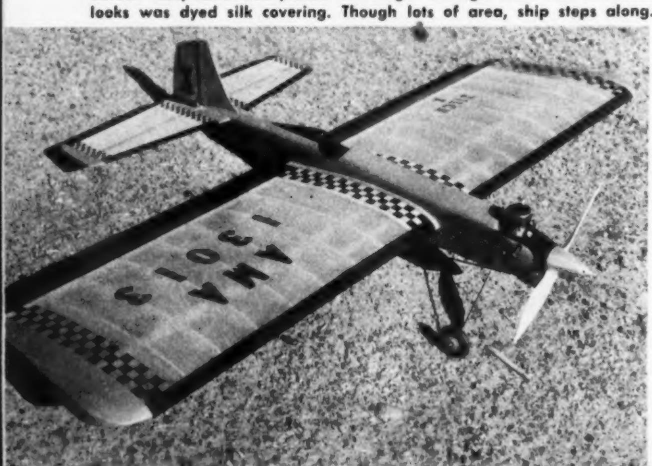
Switzerland: Lauchli, Schnabel, Maret	1983.0
Germany: Rupp, Lange, Barth	1956.6
England: Wheeler, Monks, North	1806.5
Italy: Castaglioni, Nergamaschi, Bacchi	1796.0
Holland: Teunissen, Kempen, Bausch	1502.3
Yugoslavia: Prohaska, Tasic, Strasberger	1445.8
France: Rennesson, Bourthoumieux, Guidici	1284.8
Austria: Skalla, Krill, Kainz	1228.5
Belgium: Lippens, Ferber	1127.2

RESULTS OF THE FIRST TEN

	FIRST ROUND		SECOND ROUND		TOTAL OF TWO		THIRD	TOTAL
	Time	Place	Time	Place	Time	Place	Time	Time
England Wheeler	209.4	5	298.2	4	507.6	1	300.0	807.6
Switzerland Lauchli	162.6	10	283.2	5	445.8	3	300.0	745.8
Italy Castiglioni	159.0	19	276.2	6	435.2	4	300.0	735.2
Switzerland Schnabel	164.7	15	269.3	7	434.0	5	300.0	734.2
Yugoslavia Prohaska	132.4	27	300.0	1	432.4	6	300.0	732.6
Germany Rupp	203.1	8	216.0	9	319.1	10	300.0	719.1
Germany Lange	151.5	22	300.0	1	451.5	2	246.4	697.9
Italy Gergamaschi	154.3	20	171.3	12	325.6	7	300.0	625.6
Belgium Lippens	236.5	4	84.5	25	321.5	8	300.0	621.0
Holland Teunissen	204.4	7	116.1	21	320.5	9	300.0	620.5

Part of the hardware won by Dennis Alford, ten-year old Californian ace stunt pilot, who uses the big *Zilch* X he is holding in this photograph.

Below—Emphasis was placed on weight savings. One that enhanced looks was dyed silk covering. Though lots of area, ship steps along.



ZILCH X

▼

Power, lightweight, and a generous wing area are skillfully combined by a famous stunt plane designer in this large size ship. For 29's and 32's, makes pattern cinch.

by JIM SAFTIG

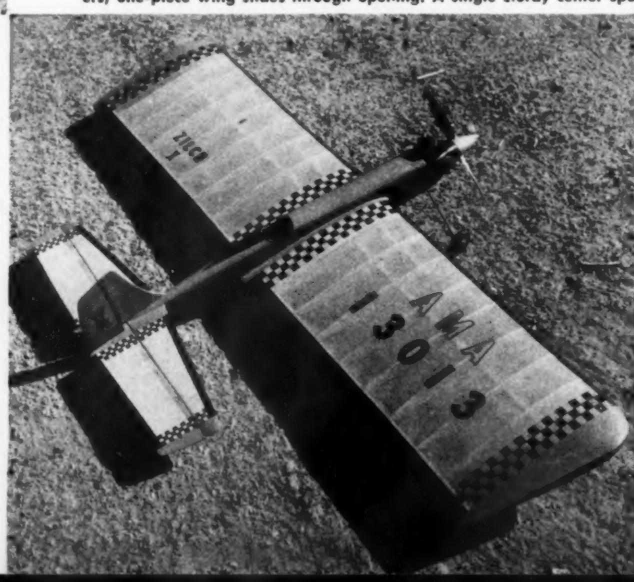
A few years back, we decided to build a "static" experimental stunt model along *Zilch* lines that would give us everything we wanted. Our thought at first was to construct a very light model with power to burn, just to check out some ideas. Everything had to be new so an airfoil section was developed, moment arms changed, and a few building short cuts were worked out. Quick and simple building methods were uppermost, as well as a ship with looks and a minimum amount of structure. We wanted to eliminate any extra gimmicks which detract rather than add to a model's looks. Also wanted was a job that would *fly*, not slowly mush, through any pattern.

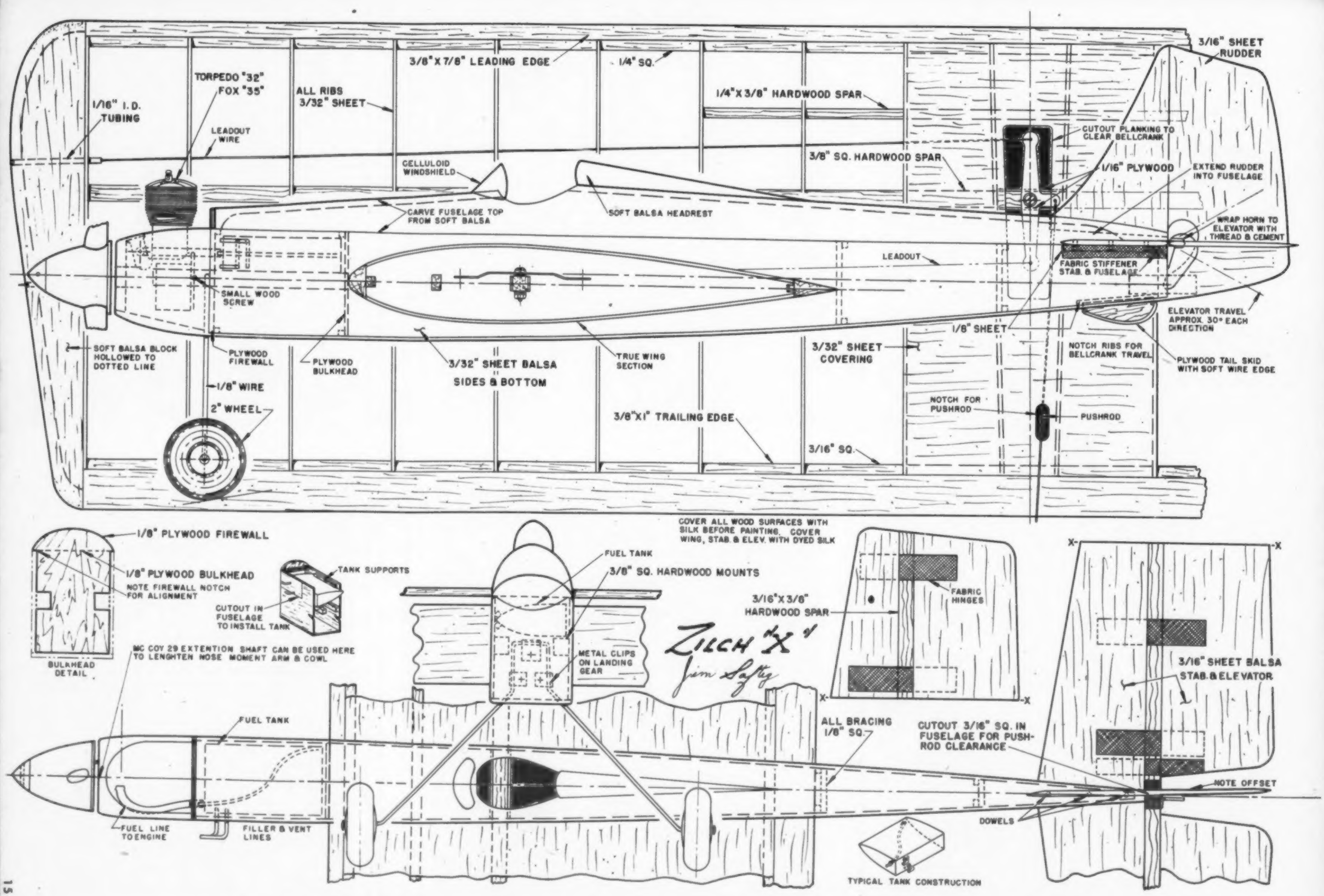
Leading and trailing edges were designed for simplicity. The fuselage was made up of 1/16" sheet balsa (really went overboard here) with the usual bulkheads. The wing had a single spar (3/8" square *spruce*). The first ship was built without the subspar. Everything down the line was sanded clean and the ship was lightened wherever possible. Dyed silk throughout the ship held paint weight to a minimum. The fuselage was sprayed with a few light coats of Cub Orange, as was the trim on the wing and tail section. For power on the first "X", a hopped-up *Super Cyclone* engine with a packed crankcase, milled head, and a bit of port polishing, was used. When the ship was finished and weighed, we were a bit skeptical and bets were made as to whether the crate would hold together in flight.

The big day arrived, and the test was on. A few simple manuevers were made and then we cut loose. Loops, vertical eights, square loops, and screaming power dives and everything else in the book were made and the job still hung together. The wings practically bent double; we tried to shake them off but they stayed with the ship. Flight after flight was made and the ship took them with no trouble at all. Plenty of top notch fliers tried to snap the wings but none were able.

This job went on the shelf and we were back at the board again. After a bit of more re-designing and adding structure here and there, we decided to try the same size ship with a smaller engine. With the added beef and a *Torp* 29, we came out with the ship in the plans. This job was not as powerful, but with 60' lines instead of the 70's, we had another swell ship. Fast, violent manuevering was a snap as was the A.M.A. pattern. Going a bit further, we passed out plans to novice and expert alike. All of the building and flying results were excellent. Windy weather didn't bother these jobs a bit. Dennis Alford, an up and coming *(Continued on page* 50)

Below—Fuselage is built up of 1/16" sheet balsa with rectangular formers; one-piece wing slides through opening. A single sturdy center spar.





FULL SIZE PLANS FOR BOTH "THE ZILCH X" AND "THE FAISON" AVAILABLE. SEE PAGE 39.

AIR WAYS

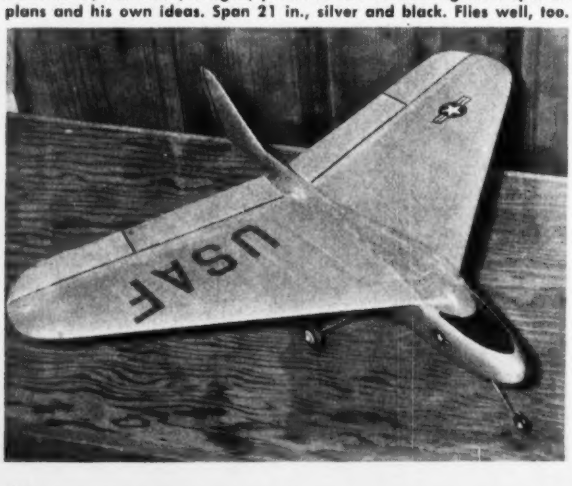
If you need inspiration, take a look at this batch of nifties turned out by other M.A.N. readers, and then get to work!

Tickled pink by the outstanding performance of his Ken Hi *Mustang* is Paul Samaras, of Denver, Colo. Power is by K & B 32. Points to note include cockpit details, wing flaps, and the effective decals.

Hornet-powered Waco Custom, by Noal Hess, Salt Lake City, spans 70 in., weighs 9-3/4 lbs. Flaps operate on full-up, stabilizer adjusts, lights.

It took four months and three sets of plans for Joe Grive, Jr., Jackson Heights, L. I., to produce this Boeing F4B-4 with O & R 29. Wing silked.

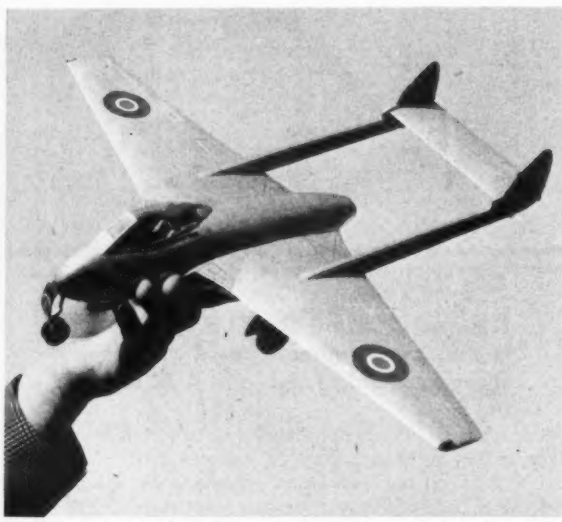
Don Helfen, Tillamook, Oregon, produced this Jetex wing from Spanish plans and his own ideas. Span 21 in., silver and black. Flies well, too.



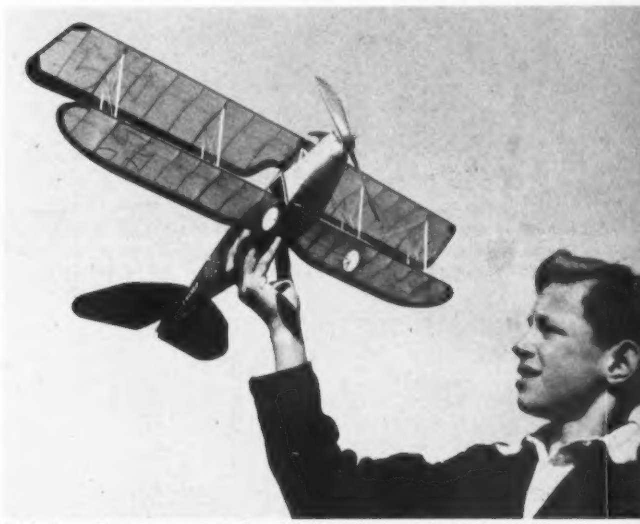
Famed for his scale jobs, Cedric Galloway, Burbank, Calif., made this *Wasp* .049 powered Great Lakes scale free flight. Wing span is 26.8 in.

Flying model Lavochkin 17 by Phil Smith, a British kit designer, has an Albon *Dart*, .5 cc diesel driving ducted fan. Did 7 min. on 45 sec. run.

.Functional rc design by Polish modeler, T. Nachtman, now living in England. Span is 70 in., weight 3 lbs. 4 oz. Uses a torsion bar nose wheel.

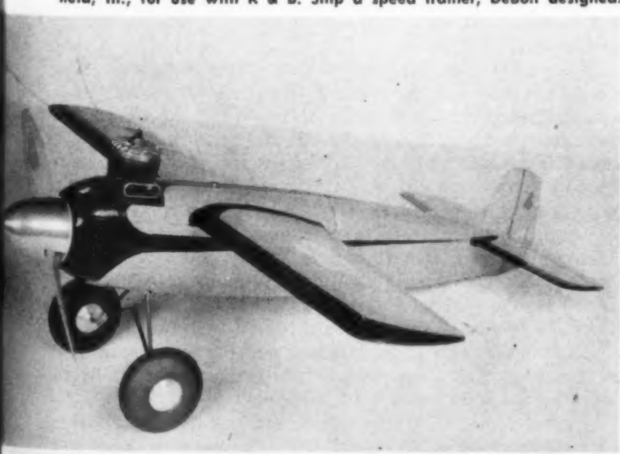


Original design for Jetex 200 powered *Vampire*, by A. J. Longstaffe, Great Britain. Plane is sheeted. Access hatch behind canopy removable.

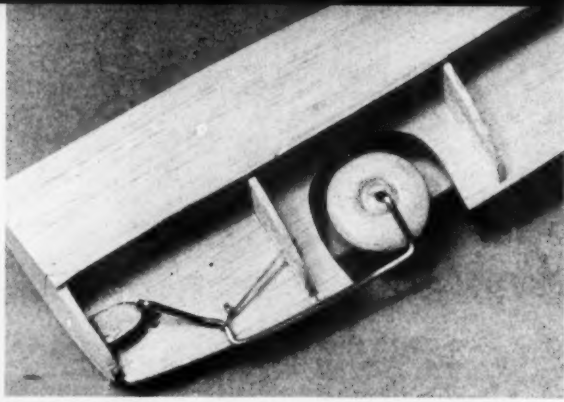


Truly beautiful rubber scale design is this Rumpler, work of K. J. A. Strowger, also of England. Gas engines have made this type almost extinct.

Little Joe (November 51 M.A.N.) duplicated by Edward G. Wilson, Springfield, Ill., for use with K & B. Ship a speed trainer, DeBolt designed.



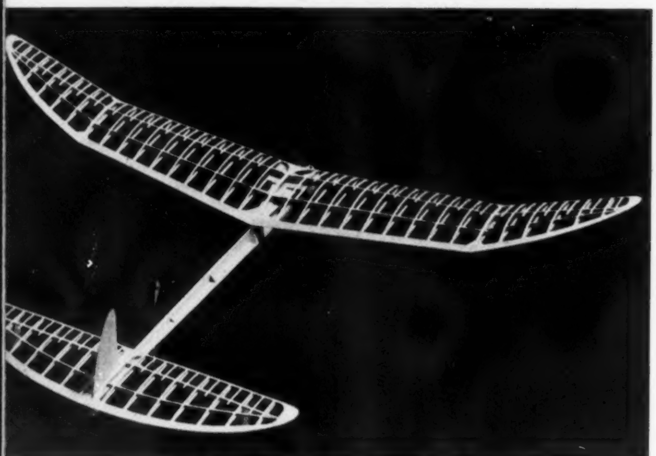
This Cleveland 76 in. Luscombe *Sedan* was put on floats by builder, Don Lloyd, Olympia, Wash. Torp ignition. Both r.o.g. and r.o.w. take-offs.



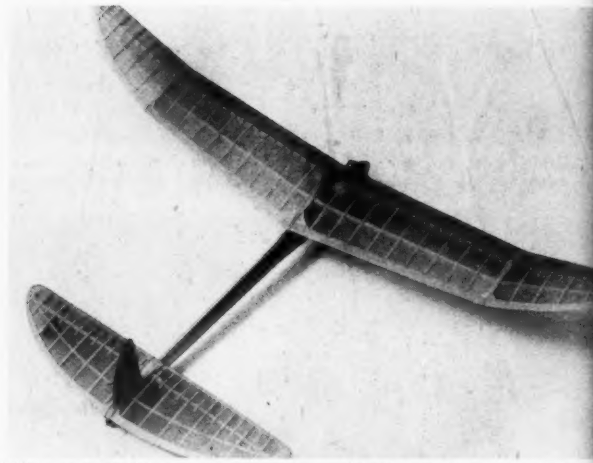
Counter-weighted wheel swings up into fuselage cut-out after take-off. Simple, double-keeled frame is easiest way to make streamlined fuselage.

FAIson

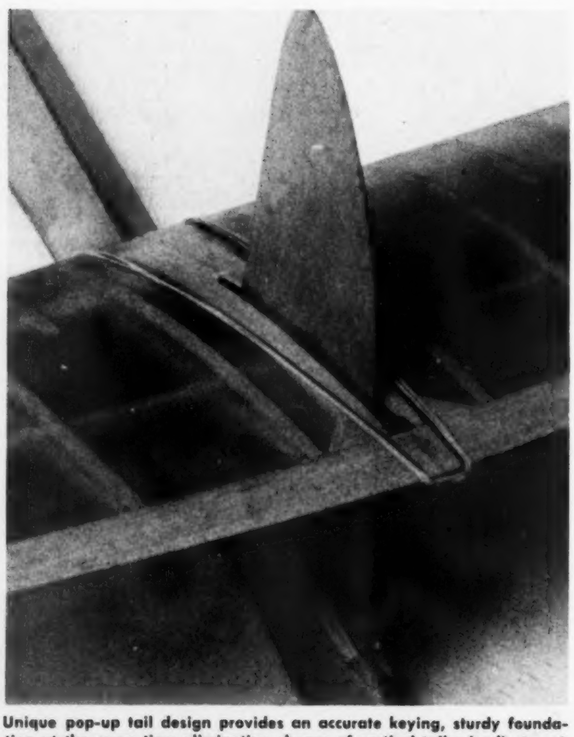
by W. S. Blanchard, Jr,



Tapered wings and elliptical stabilizer and tip planforms are easily duplicated due to the method of making and fitting the cut-out rib pieces.



When covered, *FAIson* makes one of the prettiest free flight jobs seen this year. Ship gets high enough for thermals. Without thermals? Oh, boy!



Unique pop-up tail design provides an accurate keying, sturdy foundation at the same time eliminating chance of vertical tail misadjustment.

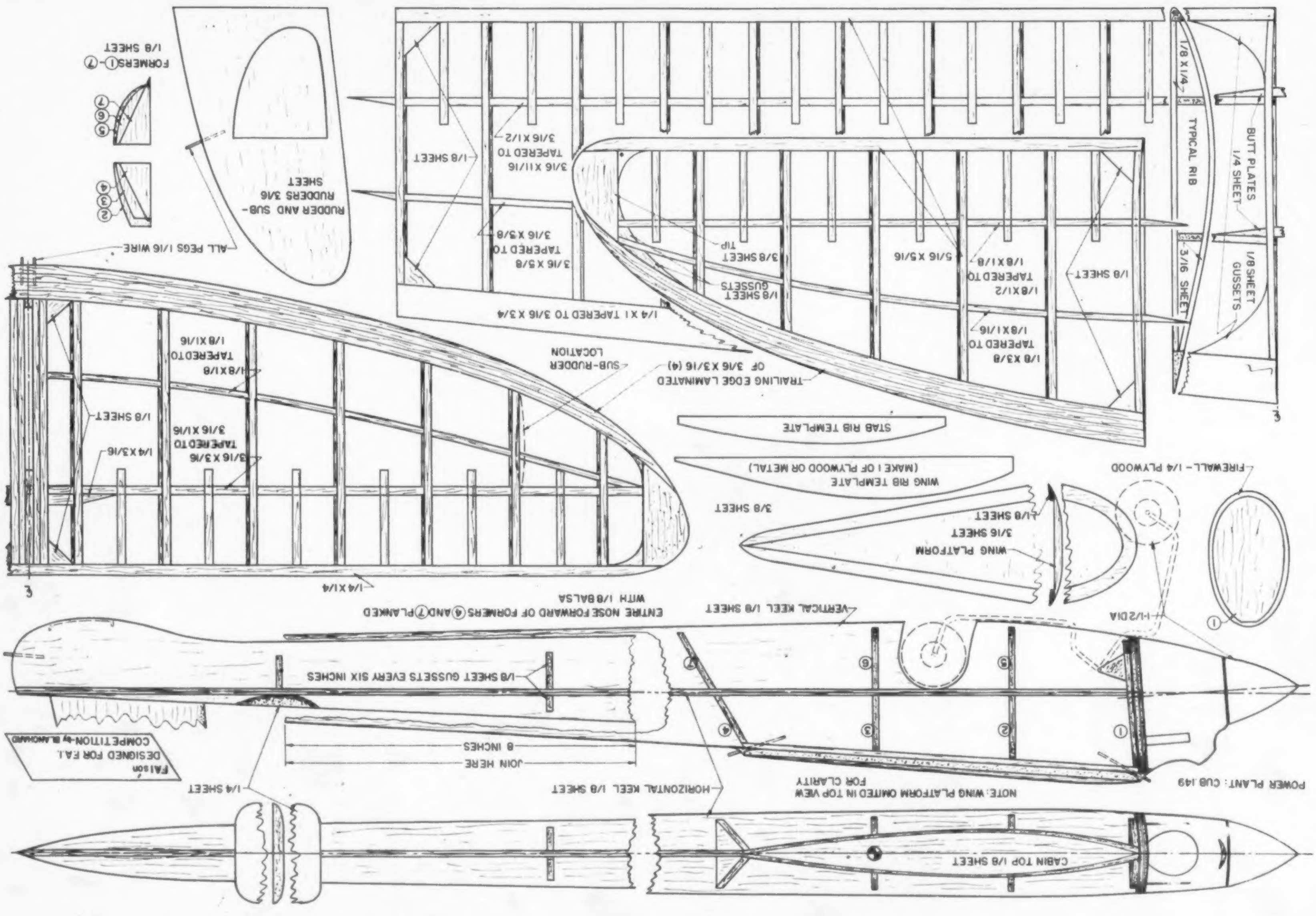
Designed around the Cub 14, this ship is the first American free flight job designed for both F.A.I. and A.M.A. rules.

▶ Considerable interest has been shown of late in International competition in the free flight gas category. The requirements, established by the Federation Aeronautique Internationale (FAI), are as follows: maximum displacement, 2.5 cc (0.153 cubic inches); minimum power loading, 200 grams/cc (115.6 ounces/cubic inch); minimum wing loading, 12 grams/square decimeter (2.74 ounces/100 square inches), based on the sum of the projected wing and horizontal tail areas; minimum fuselage cross-section, sum of the projected wing and horizontal tail areas divided by 80.

FAIson has been designed to meet FAI requirements. The *Cub* 14 is near the top limit (2.44 cc). With an eye to the predominantly non-thermal European flying, the model has been designed accordingly. By our American standards, the model is about Class B size (467 square inches of wing area). However, with the required FAI weight of 17-1/4 ounces, wing loading is 3.7 ounces/100 square inches, which is close to what the author considers optimum for non-thermal flying. However, don't underestimate the ability of the *Cub* 14 to haul an airplane of this size; at 14.9 ounces, the ship gets plenty high to ride our good old U. S. thermals, and on a non-thermal day will outfly our typical contest-type models.

The frame is light and strong, and goes together fast in spite of the rather intricate appearance of the structure. Let's begin with the fuselage.

The fuselage is built on a vertical keel, cut to outline shape, of 1/8" sheet. Next, add *(Continued on page 48)*

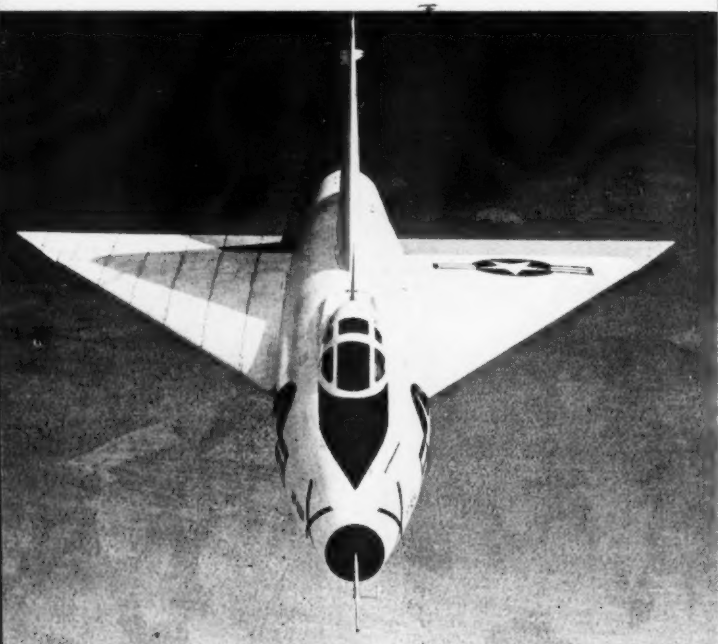


FULL SIZE PLANS FOR BOTH "THE ZILCH X" AND "THE FAISON" AVAILABLE. SEE PAGE 39.

planes in the NEWS

by DAVID ANDERTON

The British turboprop powered Fairey Gannet for anti-submarine work combines qualities of a "hunter-killer" team in one aircraft.



Glorified paper dart is Convair's XF-92A research interceptor. This ship is forerunner of the F-102 delta ordered into production at the San Diego division.

Pan American's purchase of DeHavilland Comets startled the air transport manufacturers. The Question: How long before American jet airliners go in service?

Swedish Saab-32 is a jet attack ship intended for use against ground and sea targets. Top in region of 700 mph, power a Rolls-Royce Avon axial flow turbine.

The announcement that Pan American World Airways had purchased three DeHavilland *Comet 3* jet airliners landed like a bomb in the middle of the U. S. transport industry.

The explosion completely demolished the flimsy balloon which went up after Eddie Rickenbacker, of Eastern Air Lines, blew hot and cold in England on the purchase of *Comets*. It shook loose more evidence that American manufacturers were finally waking up and thinking about jet transports. And its reverberations haven't died down yet.

It all started when PAA president Juan Trippe went to England last summer and snagged an option for three of the advanced *Comets*. The day before that option expired, PAA vice president Gledhill signed the contract in London. Under the terms, PAA gets three Series 3 *Comets* with an option to buy seven more. It will share the first six planes to come off the production line with British Overseas Airways Corp. The bill will come to a little over $2 million per plane, and the delivery date will be some time in 1956.

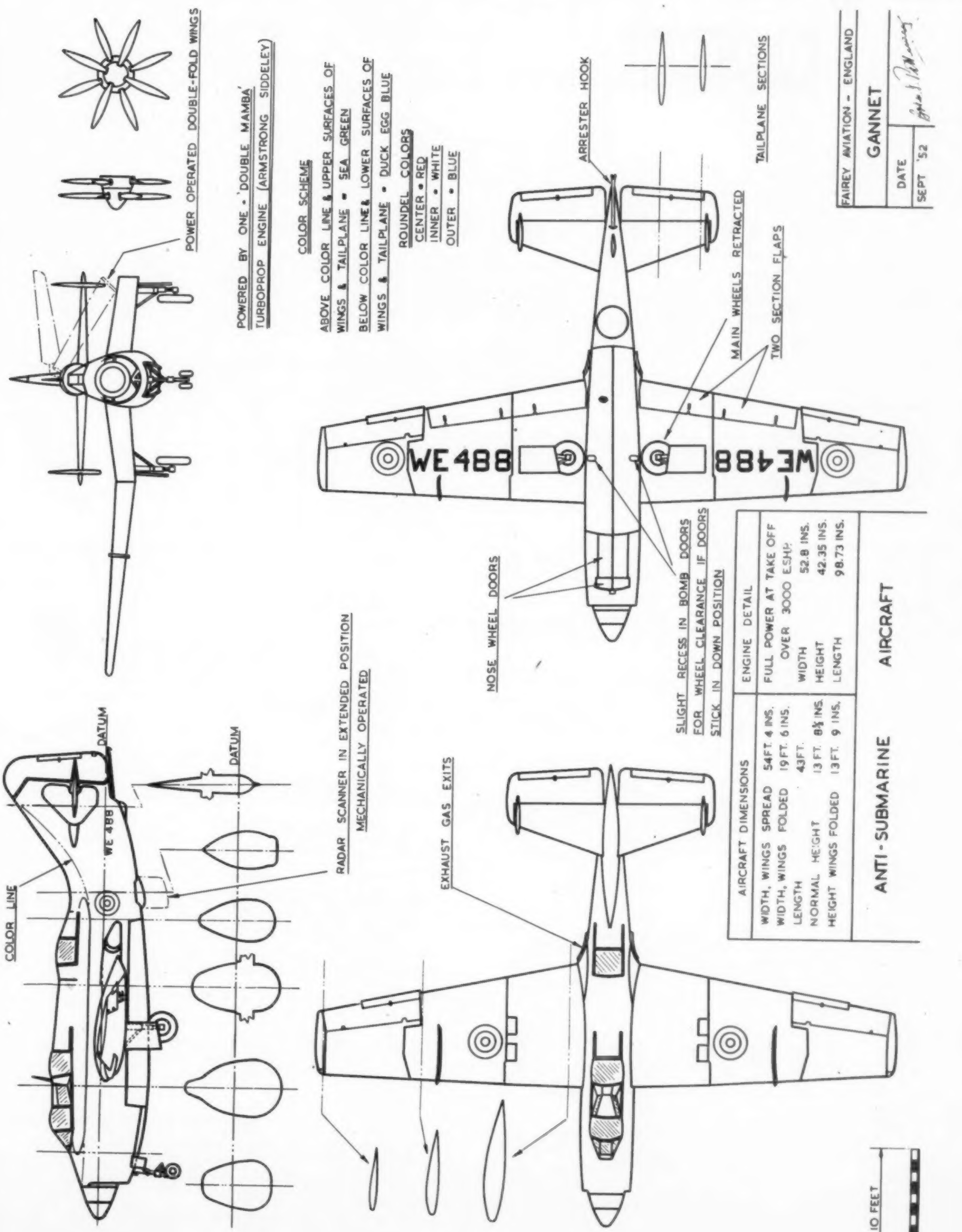
There are two possible jokers to the whole deal. The first is that the contract is reported to say the deal is off unless the Civil Aeronautics Administration will accept the British Air Registration Board's certifications of the planes. Right now, CAA is unwilling to go along with the ARB on an automatic-acceptance-of-every-case basis.

The second is that some observers have pointed out a couple of earlier PAA "orders" for advanced types—Republic's *Rainbow*, and the Convair Model 39—which never materialized. These observers say that PAA and Trippe know the value of publicity as well as Rickenbacker does, but that PAA is more subtle.

But regardless of the outcome—and I prefer to think that PAA will buy and operate *Comets*—this one fact is significant; The U. S. manufacturers of transports have been "shook rigid". From now on, you're going to hear lots more about Boeing, Douglas and Lockheed and their plans for mass transport at high speeds to American standards.

PAA's order breaks a 20-yr. hiatus in U. S. purchase of foreign transports. Tony Fokker's trimotors (actually built in Teeterboro, N. J.) were the last to make it in the early Thirties. Since then, the U. S. builders have had things their own way. Officials of the company said that PAA made its decision to buy British jets only after every possible U. S. manufacturer had been given the chance to promise earlier delivery. They *(Continued on Page* 50)

Planes Worth Modeling— THE GANNET



AIRCRAFT DIMENSIONS	
WIDTH, WINGS SPREAD	54FT. 4 INS.
WIDTH, WINGS FOLDED	19FT. 6 INS.
LENGTH	43FT.
NORMAL HEIGHT	13 FT. 8½ INS.
HEIGHT WINGS FOLDED	13FT. 9 INS.

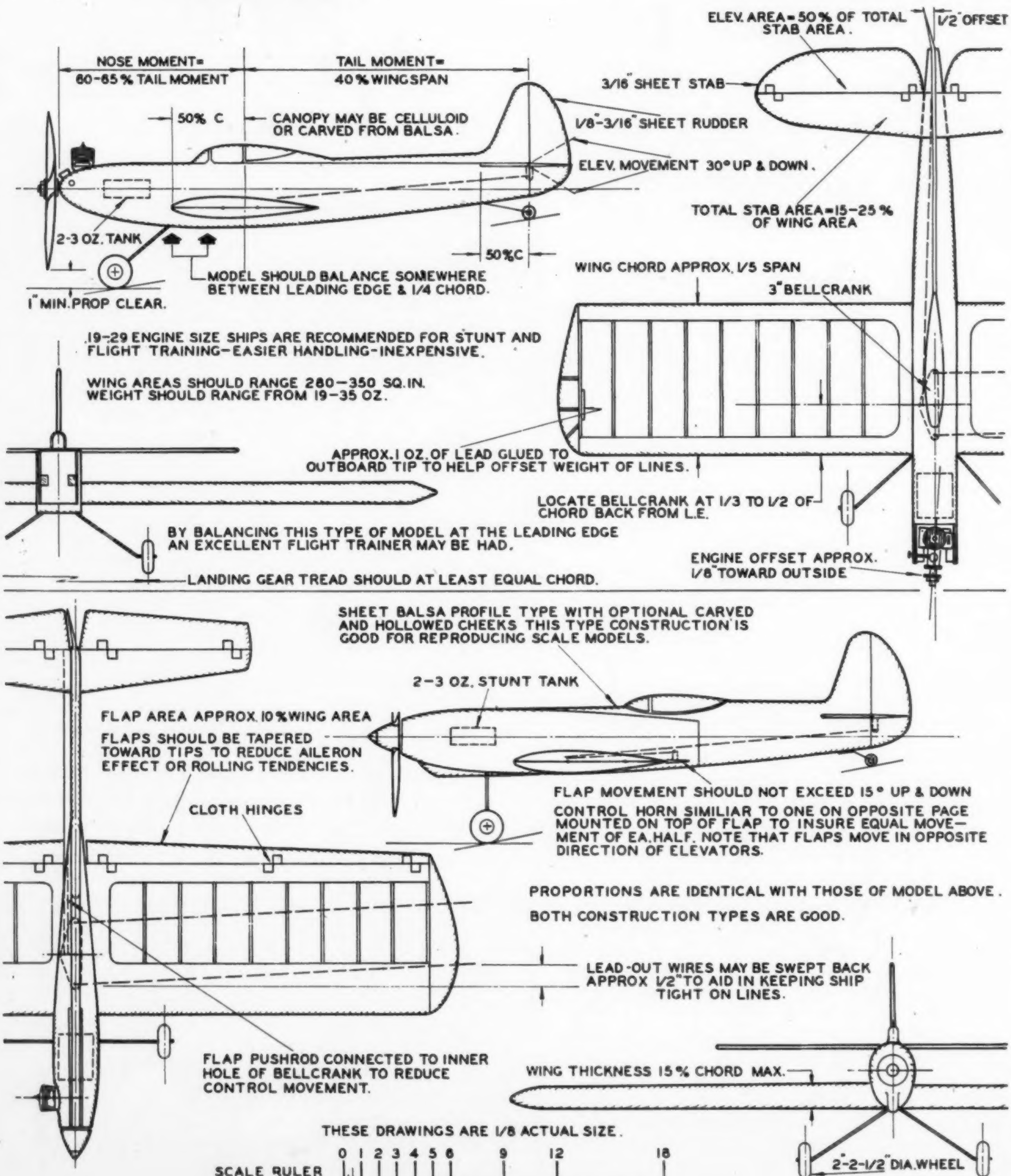
ENGINE DETAIL	
FULL POWER AT TAKE OFF OVER 3000 E.S.H.P.	
WIDTH	52.8 INS.
HEIGHT	42.35 INS.
LENGTH	98.73 INS.

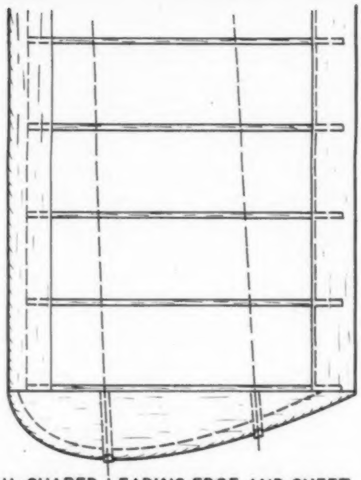
design detail

Stunt Trainer

. . . by Harry Williamson

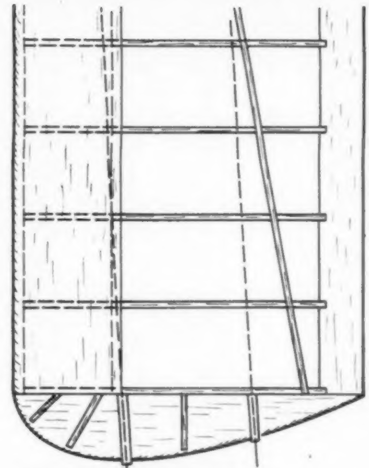
Sooner or later most clubs need a stunt trainer. This month, let's look at some interesting possibilities. Not bad for individual use, either.





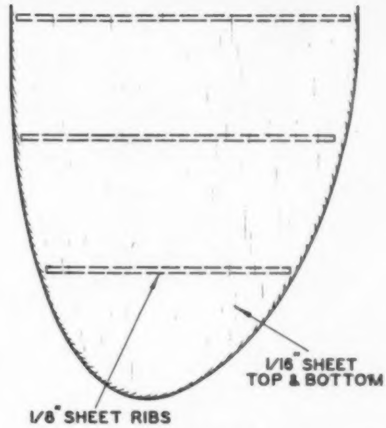
U-SHAPED LEADING EDGE AND SHEET BALSA TRAILING EDGE.

THIS TYPE IS VERY STRONG AND MOST EASILY BUILT—RECOMMENDED—NOTE 1/16" SHEET BALSA FILLER BETWEEN T.E. HALVES. HOLLOWED BALSA TIP SHOWN.

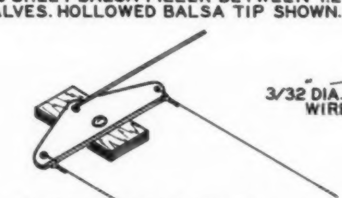


D-SHAPED LEADING EDGE AND SOLID T.E. WITH 1/8" X 1/4" ANTI-WARP SPARS.

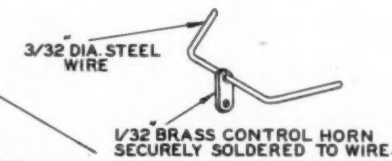
L.E. COVERED WITH 1/16" SHEET. NOTE SQUARE MAIN SPARS. THIS TYPE IS LIGHT AND VERY STRONG. SHEET BALSA TIP SHOWN.

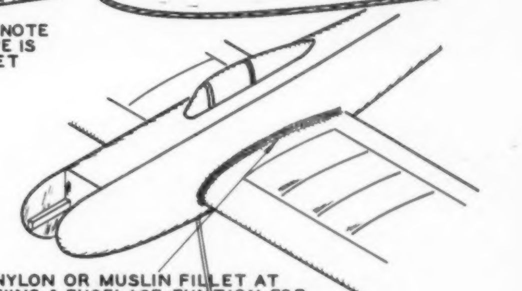


ALL SHEET BALSA "FIREBALL" TYPE—MORE DIFFICULT TO BUILD—SHOULD NOT BE USED FOR WINGS OVER 300 SQ. IN. AREA, WITHOUT THE ADDITION OF SPARS.

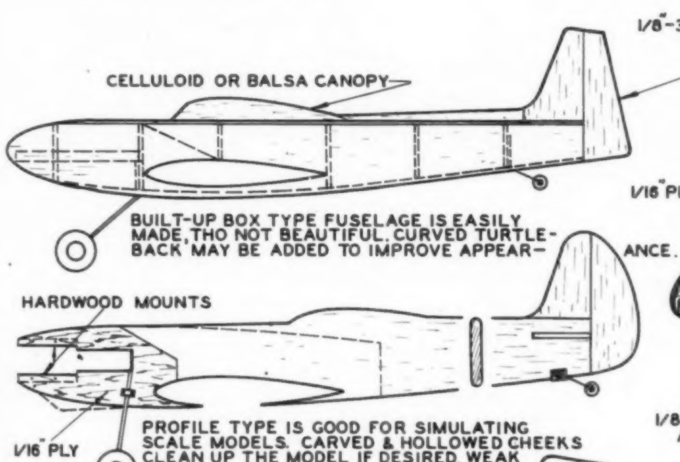


USE 3" BELLCRANK TO REDUCE CONTROL SENSITIVITY. BELLCRANK SHOULD ALWAYS BE MOUNTED ON HARDWOOD OR THICK PLYWOOD.

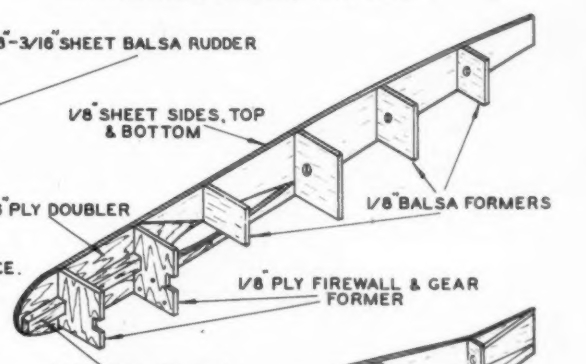


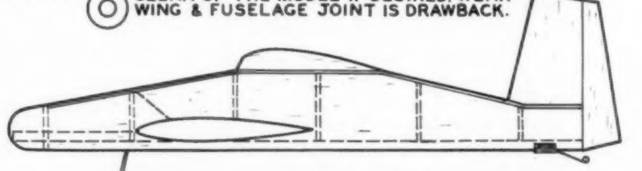


NYLON OR MUSLIN FILLET AT WING & FUSELAGE JUNTION FOR EXTRA STRENGTH—COAT WITH GLUE.

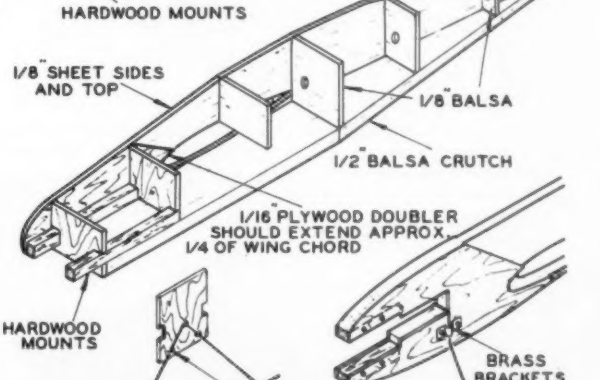


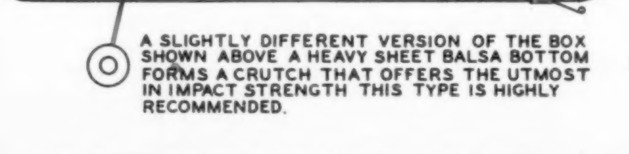
BUILT-UP BOX TYPE FUSELAGE IS EASILY MADE, THO NOT BEAUTIFUL. CURVED TURTLE-BACK MAY BE ADDED TO IMPROVE APPEAR—ANCE.





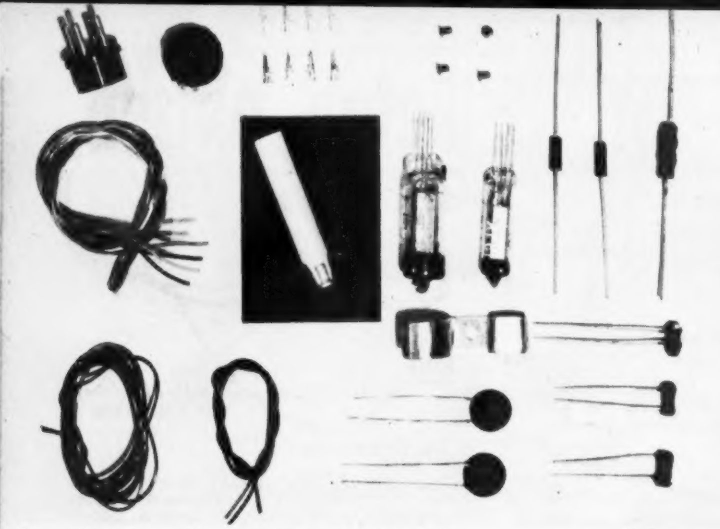
PROFILE TYPE IS GOOD FOR SIMULATING SCALE MODELS. CARVED & HOLLOWED CHEEKS CLEAN UP THE MODEL IF DESIRED. WEAK WING & FUSELAGE JOINT IS DRAWBACK.





A SLIGHTLY DIFFERENT VERSION OF THE BOX SHOWN ABOVE A HEAVY SHEET BALSA BOTTOM FORMS A CRUTCH THAT OFFERS THE UTMOST IN IMPACT STRENGTH THIS TYPE IS HIGHLY RECOMMENDED.

ALL THREE OF THE BASIC CONSTRUCTION TYPES SHOWN ARE RECOMMENDED FOR STUNT TRAINER, CLUB BUILDING PROJECTS.



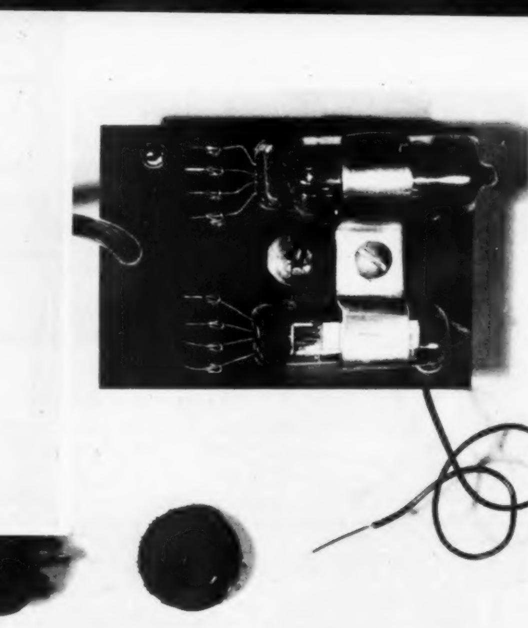


Figure 1 — These are parts, excepting relay which, in this installation, is shock mounted independently. Receiver is rigid, if so desired.

Figure 7, right—Finished receiver is not much longer than the two tiny gas tubes themselves.

The Lorenz Receiver

▼

by ED LORENZ

A two-tube design giving longer tube life, greater sensitivity, reliable relay action, no antenna trimming required.

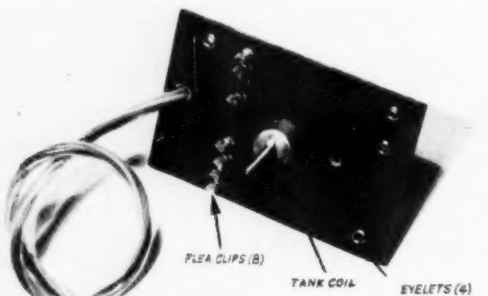


Figure 3—The flea clips permit easy installation and replacement of the tubes. It is unnecessary and most inadvisable to ever solder tube leads.

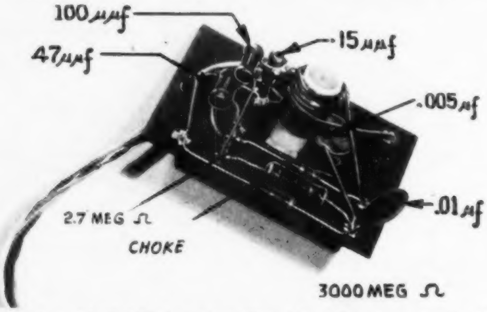
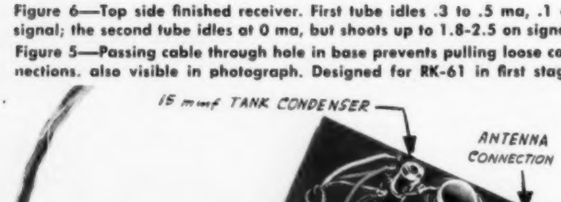


Figure 6—Top side finished receiver. First tube idles .3 to .5 ma, .1 on signal; the second tube idles at 0 ma, but shoots up to 1.8-2.5 on signal.

Figure 5—Passing cable through hole in base prevents pulling loose connections, also visible in photograph. Designed for RK-61 in first stage.



Editor's Note — This receiver was tested by MAN over a period of nine months, making many hundreds of flights. Its performance is oustanding. For 27.255 operation, it is a gas tuber which, with the hard tube Miller receiver presented last issue, completes the coverage of receivers for more experienced readers who ordinarily build up various receiver designs. All others are referred to Aerotrol, by Berkeley, on 27.255, and to MacNabb on 465 and 27.255. Imported equipment is handled by Polk's and American Telasco.

▶ The receiver described in this article is the result of the author's search for a reliable gas tube circuit. A relay operating in a positive manner rather than in the conventional negative way was desired. This means that the relay should close upon receipt of a signal, thus reducing the length of time the tube is conducting, and thereby prolonging its life and also the life of the "B" batteries. Since the life of the gas tubes used for radio control work (the RK-61 and XFG-1) depends on the amount of plate current being drawn, it was decided to reduce the plate current from the regular 1.5 ma to around .5 ma or less. In view of the fact that a low current like this would prove inadequate for relay operation, a relay tube, also called trigger tube, was added.

Basically, the operation follows this pattern: As in any super regenerative circuit there is an audible hiss which is heard when no incoming signal is present. Upon receipt of a signal,

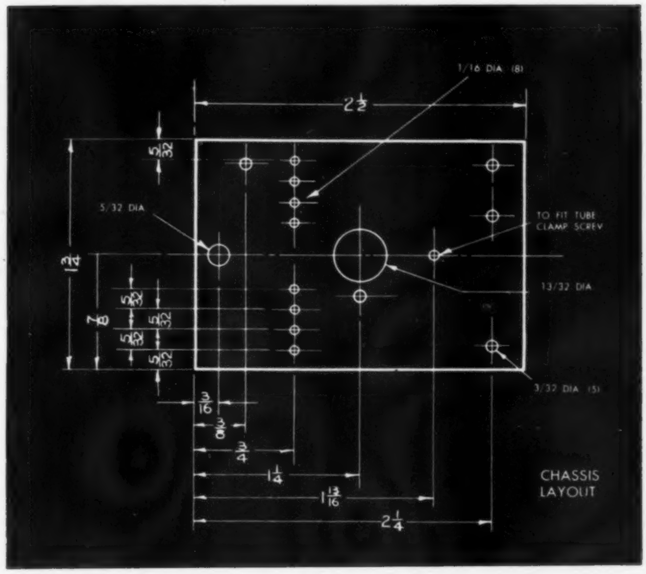


Figure 2—Fully dimensioned chassis, showing all holes for eyelets, flea clips, and tank. Due to low drain, smallest B batteries may be used. Combined idle very low.

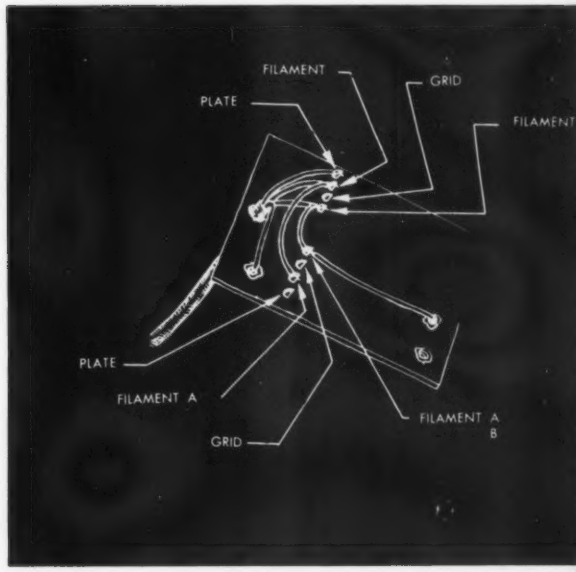
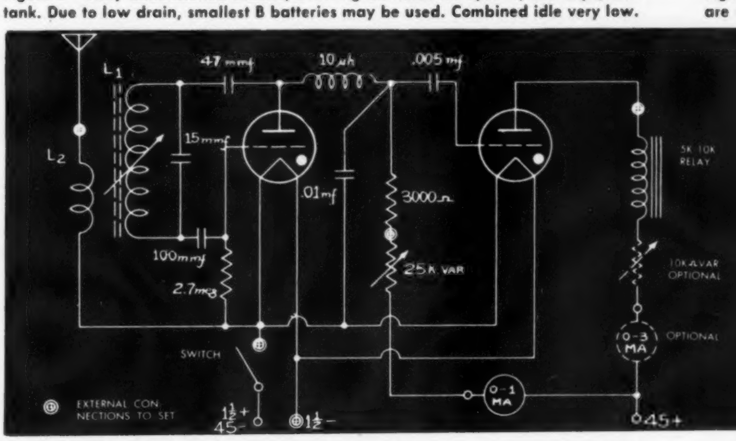
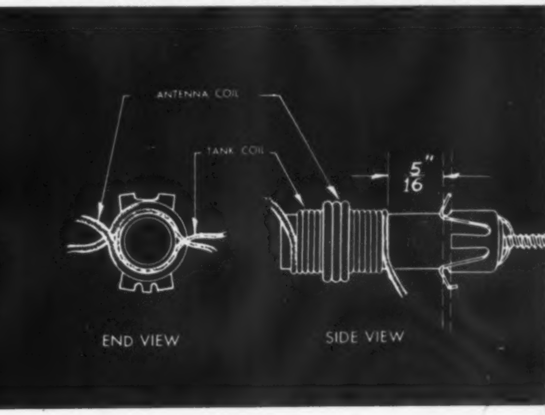


Figure 9—Compare the drawing with picture, Figure 5. Two jacks are required to enable meter readings. Relay closes with signal.





For those who understand radio itself, schematic, Figure 8, will prove interesting. The large amount of current change in the second tube makes for both a positive and reliable relay operation, and relative freedom from erratic flights due to the effects of vibration. Figure 4 is on the right.

this hiss disappears or greatly diminishes, and it is this characteristic that we have used in triggering the second or relay tube. The no-signal hiss in the first tube is fed to the grid of the second through the coupling condenser. This places a bias on the grid of the second tube which prevents the tube from conducting and passing current through the relay. Now, when the first tube receives a signal, the bias is removed from the second tube and the relay gets the full amount of current passed by the relay tube. In operation, the current on the two tubes is as follows: First Tube, no signal, .3 to .5 ma—signal, .1 ma; Second Tube, 0 ma, 1.8 to 2.5 ma. As can be seen, the gas tubes operate either at zero or very low plate current for the greater part of the time. This results in better battery economy since very little current is drawn when no signal is received. Primarily, however, gas tubes were chosen for the tube complement because of their overall efficiency and for the ease with which they enable the circuit to be built. The tank circuit has been designed to produce a hiss level of high amplitude and stability. The amplitude of the hiss level determines the amount of bias applied to the second tube. This amounts to an average of -4 to -6 volts, which is more than the -3 volts needed on the second tube.

This two-tube receiver has many advantages. First is the extra long life from the efficient gas tubes, as well as the low "B" battery drain gained by using them. Thus the smallest "B" hearing aid batteries are practical for this purpose. Another advantage is the positive action from the relay, which in this case, can be mounted separately as far as 200 feet away from the receiver. The receiver itself is extremely light in weight, has great sensitivity and selectivity. No antenna tuning is necessary.

You will find in constructing this unusual receiver that many methods of layout are possible. It is felt, however, that the one presented here is the simplest and most compact of all. It is suggested that the entire article be read through before construction is started and that the picture be studied in order to clarify the building of the set.

Figure 1 shows the necessary parts, all of which may be obtained in a "kit" type package from Control Research, P. O. Box 9, Hampton, Virginia; from Polk's Movie Craft Hobbies, 314 Fifth Ave., New York, N. Y. or elsewhere. The complete list is comprised of the following:

one 1/16" x 1-3/4" x 2-1/2" micarta; one RK-61 first tube; one RK-61 or XFG-1 second tube; one 3/8" coil form; eight flea clips; four 3/32" or 1/8" eyelets; one 25,000 ohm potentiometer; one 4-prong plug; one 10 micro-henry choke; one 2.7 megohm 1/2-watt resistor; one 3,000 ohm 1/2-watt resistor; one 15 uuf ceramic capacitor; one 47 uuf ceramic capacitor; one 100 uuf ceramic capacitor; one .005 uf ceramic capacitor; one .01 uf ceramic capacitor; *(Continued on page 42)*

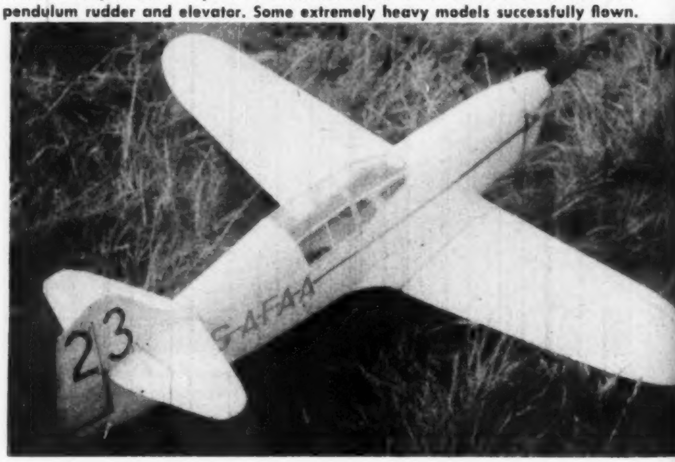
This neat little semi-scale low wing with its open cockpit, combined pendulum rudder control and Mills 0.75 diesel for fun flying. Pendulum control was first used in Europe for contest free flight.

Even scale jobs without dihedral will fly when using pendulum operated controls. How they do it is explained here by the British free flight champion for the 1951 season.

TRY PENDULUM CONTROL

by P. B. WYATT

How would you like to try this 40-inch *Mew Gull* with 3.46 diesel? It has both pendulum rudder and elevator. Some extremely heavy models successfully flown.



▶ Since the advent of small diesel and glow-plug motors, many aeromodelers have been trying their hands at exact scale free flight models of full size machines. Many have met with success with high wing monoplanes, such as Piper *Cubs* and Aeronca *Sedans*, but when it comes to a "different" model, like a fast-flying *Mustang* or a Fokker "Tripe" with no dihedral, stability becomes a big problem.

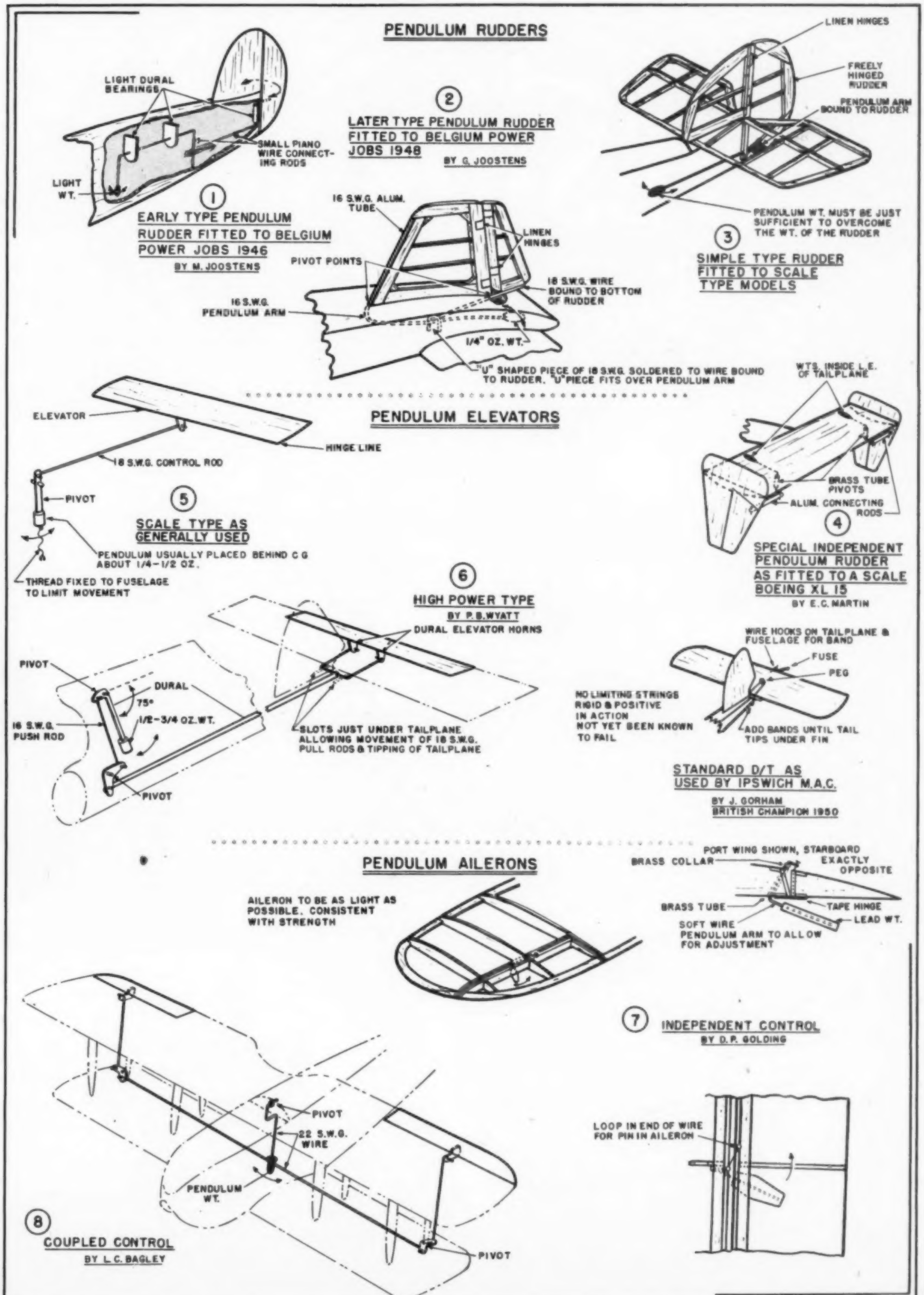
Over several years many methods of auto-stabilizing control have been tried out and the most successful of these have employed pendulums. The following article shows some of the methods which have been used, either singly or in combination, to control practically any type of true scale free flight model you may wish to make.

Rudder Control! This method was first used by the Belgians on high power duration jobs, and was seen in England during the 1947 contest season. (See Fig. 1 and 2). The Belgian models were light shoulder wing planes of 45"-50" span, using five cc (0.3 cu. in.) motors with 22° downthrust. When banking, the pendulum swings to the inside of the turn, moving the rudder the opposite way, and so preventing a spiral dive from building up. The weight used for the pendulum should be just heavy enough to overcome the weight of the rudder. If too much weight is used, centrifugal force may take over on the pendulum and force the plane into a tighter turn, with the inevitable result.

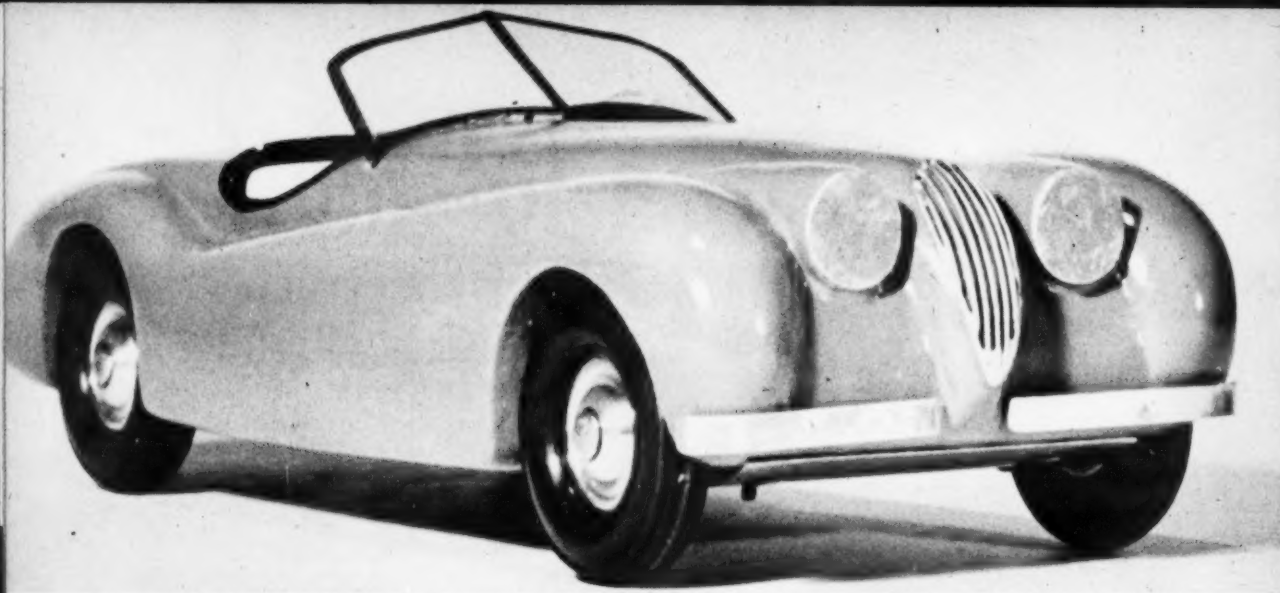
This rudder idea was taken over by British modelers and applied to scale models of all kinds (Fig. 3 and 4). It allows planes to be built with scale dihedral angles on the wings, and scale fins and tailplanes. Usually the true scale portion of the rudder is made movable and the pendulum movement limited to about 10° total swing.

The rudder control is the most popular in use, owing to its simplicity, but there are a few disadvantages. Since the pendulum has to be very free in action, it tends to over swing both ways while the plane is in flight, and this makes the flight path rather erratic. This defect doesn't show up too badly on low-powered World War I bipes, but when you get to faster jobs, such as Hawker *Typhoon I.B.'s*, something has to be done to control the climb and prevent looping.

Elevator Control! Mr. P. E. Norman, a well known scale modeler here, uses elevator control with great success on most of his heavy-weight, high-speed (*Continued on page* 45)


PENDULUM RUDDERS
LIGHT DURAL BEARINGS
SMALL PIANO WIRE CONNECTING RODS
LIGHT WT.
1
EARLY TYPE PENDULUM RUDDER FITTED TO BELGIUM POWER JOBS 1946
BY M. JOOSTENS
2
LATER TYPE PENDULUM RUDDER FITTED TO BELGIUM POWER JOBS 1948
BY G. JOOSTENS
16 S.W.G. ALUM. TUBE
LINEN HINGES
PIVOT POINTS
18 S.W.G. WIRE BOUND TO BOTTOM OF RUDDER
16 S.W.G. PENDULUM ARM
1/4" OZ. WT.
"U" SHAPED PIECE OF 18 S.W.G. SOLDERED TO WIRE BOUND TO RUDDER. "U" PIECE FITS OVER PENDULUM ARM
LINEN HINGES
FREELY HINGED RUDDER
PENDULUM ARM BOUND TO RUDDER
PENDULUM WT. MUST BE JUST SUFFICIENT TO OVERCOME THE WT. OF THE RUDDER
3
SIMPLE TYPE RUDDER FITTED TO SCALE TYPE MODELS
PENDULUM ELEVATORS
ELEVATOR
HINGE LINE
18 S.W.G. CONTROL ROD
PIVOT
5
SCALE TYPE AS GENERALLY USED
PENDULUM USUALLY PLACED BEHIND C G ABOUT 1/4-1/2 OZ.
THREAD FIXED TO FUSELAGE TO LIMIT MOVEMENT
WTS. INSIDE L.E. OF TAILPLANE
BRASS TUBE PIVOTS
ALUM. CONNECTING RODS
4
SPECIAL INDEPENDENT PENDULUM RUDDER AS FITTED TO A SCALE BOEING XL 15
BY E.C. MARTIN
6
HIGH POWER TYPE
BY P.B. WYATT
DURAL ELEVATOR HORNS
PIVOT
DURAL
75°
16 S.W.G. PUSH ROD
1/2-3/4 OZ. WT.
SLOTS JUST UNDER TAILPLANE ALLOWING MOVEMENT OF 18 S.W.G. PULL RODS & TIPPING OF TAILPLANE
PIVOT
WIRE HOOKS ON TAILPLANE & FUSELAGE FOR BAND
FUSE
PEG
NO LIMITING STRINGS RIGID & POSITIVE IN ACTION NOT YET BEEN KNOWN TO FAIL
ADD BANDS UNTIL TAIL TIPS UNDER FIN
STANDARD D/T AS USED BY IPSWICH M.A.C.
BY J. GORHAM BRITISH CHAMPION 1950
PENDULUM AILERONS
AILERON TO BE AS LIGHT AS POSSIBLE, CONSISTENT WITH STRENGTH
PORT WING SHOWN, STARBOARD EXACTLY OPPOSITE
BRASS COLLAR
BRASS TUBE
TAPE HINGE
LEAD WT.
SOFT WIRE PENDULUM ARM TO ALLOW FOR ADJUSTMENT
7
INDEPENDENT CONTROL
BY D.P. GOLDING
LOOP IN END OF WIRE FOR PIN IN AILERON
PIVOT
22 S.W.G. WIRE
PENDULUM WT.
PIVOT
8
COUPLED CONTROL
BY L.C. BAGLEY

li more...worth a lot more!
PE
the best!
TESTORS
DOPE
OFFICIAL ARMY - NAVY AIRCRAFT
INSIGNIA RED
TESTOR CHEMICAL CO. ROCKFORD, ILL
TEST EL SUPPLIES, TOO...by name!
LSA
TESTORS
"39"
"39" MODEL
ENGINE FUEL
TESTORS
MODEL
AIRPLANE
Cement
EXTRA
FAST
DRYING
Strong!
TESTORS
MODEL
AIRPLANE
Cement
FAST
DRYING
Strong!
TESTORS MODEL AIRPLANE CEMENTS
• Formula "A" . . . extra fast drying
• Formula "B" . . . fast drying
TESTORS
STA
STA HOT FUEL PROOF
FINISH
• ROCKFORD, ILLINOIS



Put a couple of flashlight bulbs in those head lamps and the illusion would be complete. Sheet balsa and blocks, make the body a cinch to build.

RX for snowbound hobbyists: The Jaguar, fastest stock car, for either gas or electric motor.

The Jaguar

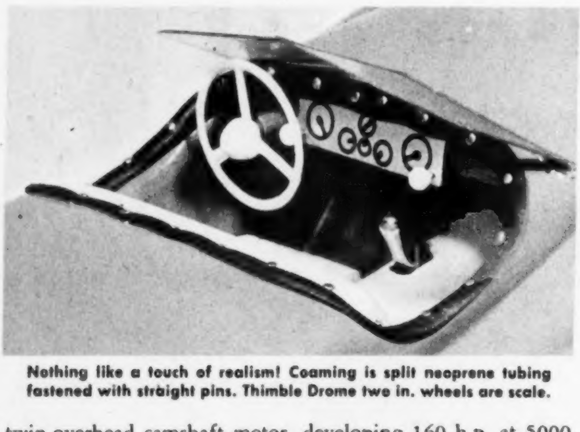
▼

by Dick Ealy

▶ On May 30, 1949 the *Royal Auto Club* of Belgium certified 132.6 mph over a measured mile with a standard *Jaguar;* this represents the highest speed ever achieved by a stock production job. Only ordinary pump fuel was used on this test, making it all the more remarkable. Victory after victory on the European Continent and in the U. S. demonstrated its superiority. On road-racing, cornering ability counting in keeping up average speed. Here the *Jag* takes a back seat to no one, as an almost vertical steering wheel and fast gear ratio allow 90° crossed-arm turns. Large turns can be negotiated with speeds up to 100 mph with complete stability, sharp corners can be taken at surprising speeds before sliding, and this condition is quickly corrected. Under the bonnet is a jewel-like, six cylinder, 70° twin-overhead camshaft motor, developing 160 h.p. at 5000 RPM and unsupercharged. Bore is 83mm. and stroke 106mm. or 3442cc.—less than that of a Chevrolet! Compression ratio is eight to one and mileage surprisingly high. The XK 120 can reach 60 mph in only 9.1 sec.

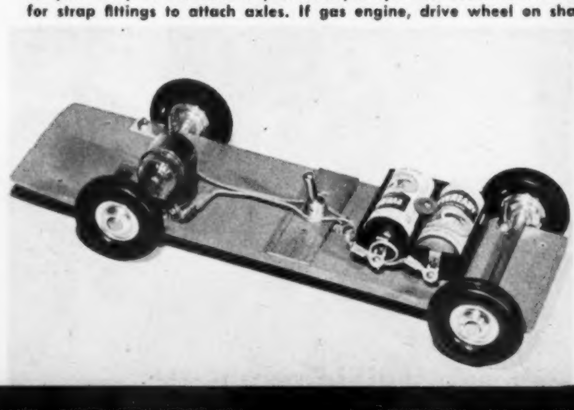
The model, built to 15/16"—1" scale, not only looks like its big brother, but performs like a champion. In the electric motor version even the gear shift lever is duplicated on the model by the switch arm. Just shove it forward and you start burning rubber. The front wheels can be adjusted so the racer turns left

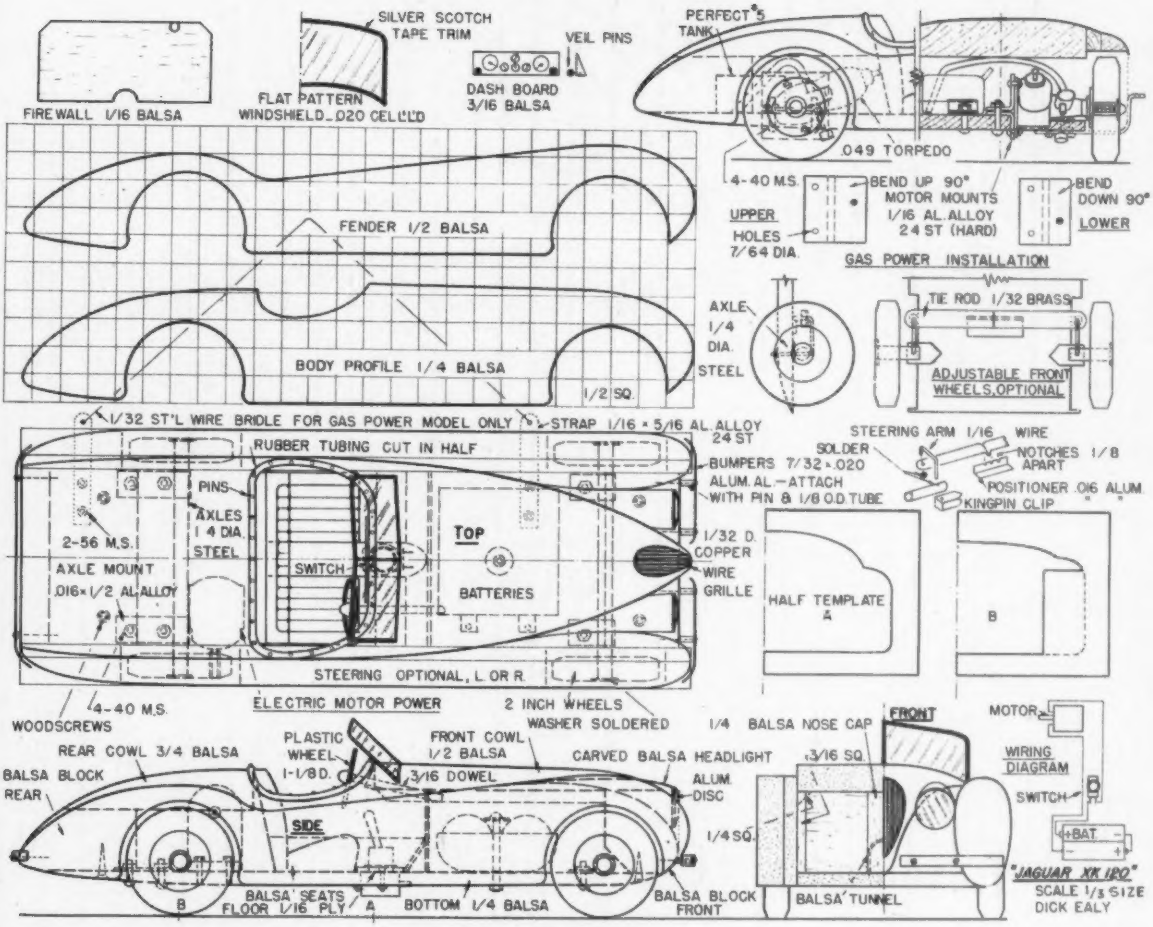
As big as your two hands, this car can be assembled in an evening. On electric motor version, toggle switch doubles as a gear shift.



Nothing like a touch of realism! Coaming is split neoprene tubing fastened with straight pins. Thimble Drome two in. wheels are scale.

All parts may be obtained in your hobby shop. Note use of sheet metal for strap fittings to attach axles. If gas engine, drive wheel on shaft.

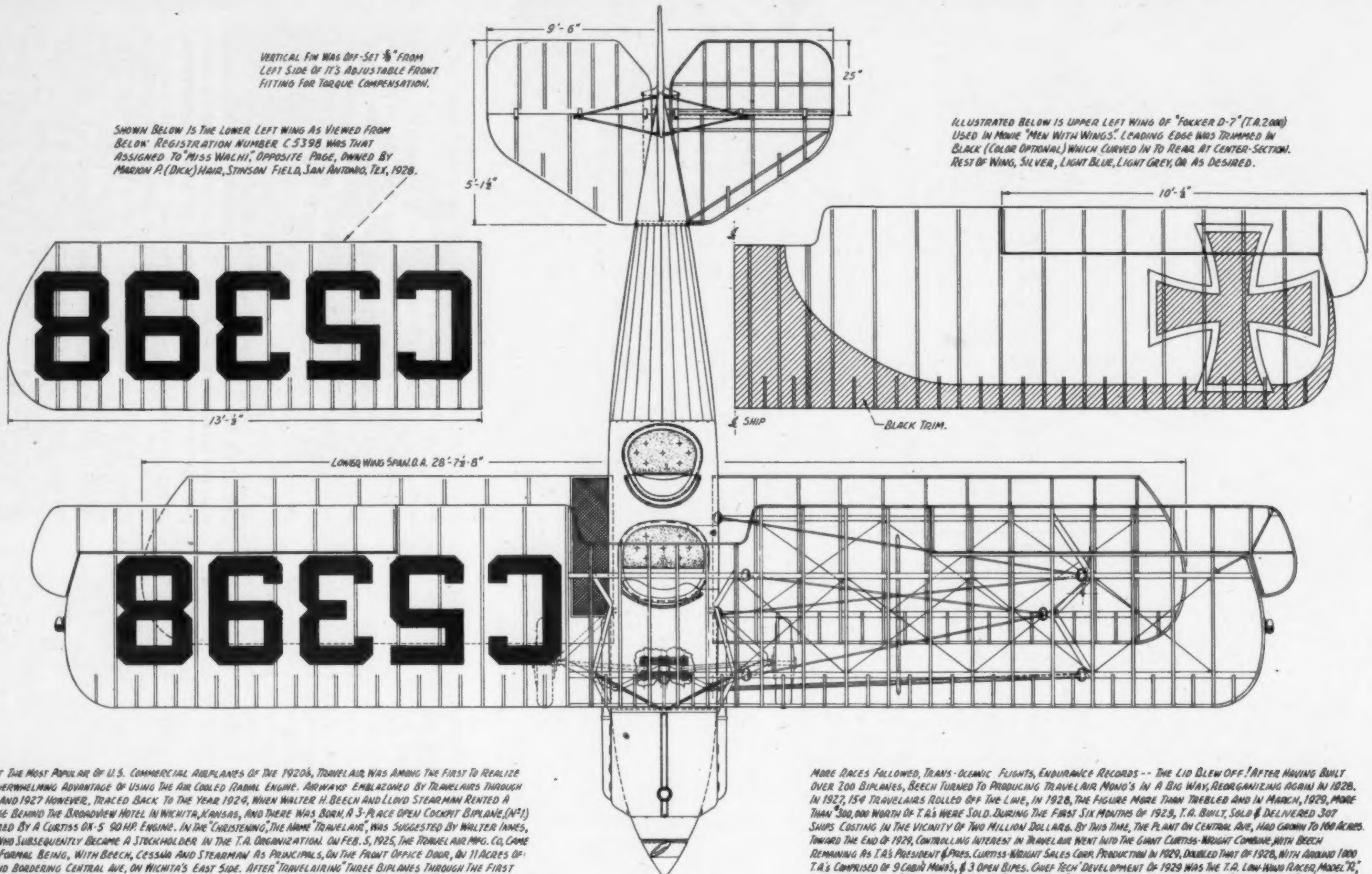




or right. A gas motor of .049 to .099 (alternative installation) is shown and a straight axle is used here on front, as model is tethered.

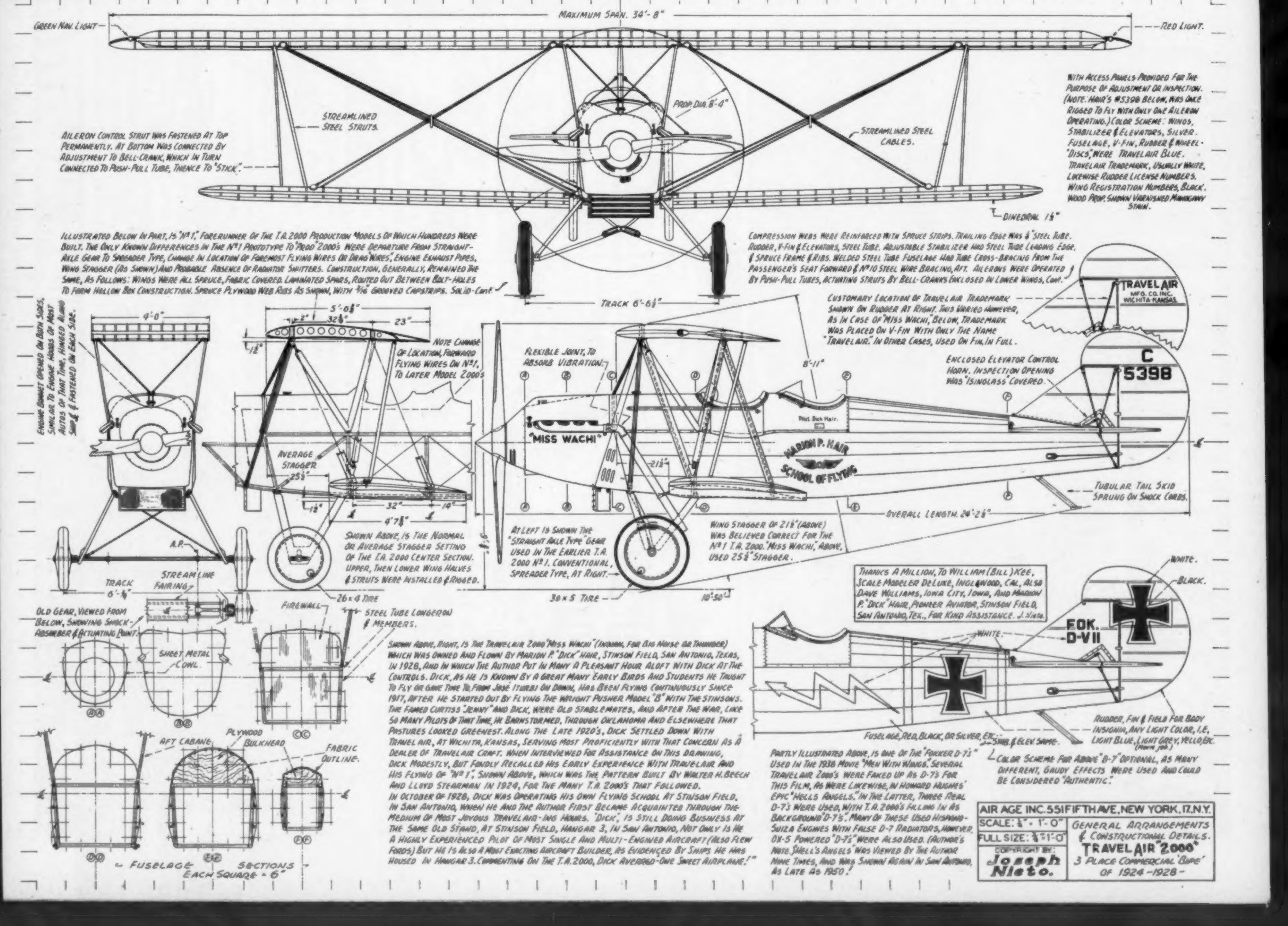
There's a slight charge of $4000 for a *Jag* and, since most of the modelers are not in that income bracket, maybe you can crack the piggy-bank for a "couple" buck and build a working scale model. Construction is all balsa and you'll not have any difficulty if you've had some carving experience. Enlarge templates for fender and body profile. These have been drawn with 1/2" squares to help in duplication. Trace enlarged template of fender on 1/2" thick soft balsa and cut out around edge with coping saw. Trim with knife and sandpaper. Make two fenders. Then trace the body profile template on 1/4" soft balsa, saw and trim as on fender. Make two body profiles. Next make soft balsa nose block 1-3/8" x 1-1/2" x 3-5/32". Then cut rear soft balsa block 1-1/2" x 2-1/8" x 3-5/32". The front cowl is cut from 1/2" x 4" soft sheet balsa and measures 1/2" x 3-5/32" x 5-1/2". Rear cowl is a soft balsa block 3/4" x 3-5/32" x 4". Lastly, bottom is cut from 1/4" hard balsa for the electric powered model which is being described, and is 1/4" x 3-5/32" x 11-1/8".

For the gas powered job, a 1/4" plywood base is recommended. Car in making above parts will make the next assembly "blocking-up" job a cinch. We used a white glue called *Wilhold* which dries clearly and is easier to handle on large surface areas. The joint formed is stronger than wood. Regular model cement is fine but several coats need be applied to assure a good bond. Clamping should be used if possible. *Wilhold* dries about as fast as regular cement. A couple hours is best for time. Begin assembly by cementing fender to body profile making a left and right unit. While fender units are drying, take the 1/4" bottom and pin front and rear balsa blocks in exact position. Side units are next cemented in proper positiion, being sure to cement them to front and rear blocks only, as bottom unit is to be removable. Then cement top front balsa cowl and top rear balsa cowl in place. Front cockpit corners are filled in with a 3/4" sq. piece of 1/2" thick balsa and later trimmed to true outline. Note in front view a piece of 1/4" sq. is trimmed to triangular shape and re-enforces the corner between body profile and top cowl. This piece is 4-1/8" long. A 3/16" sq. balsa fills in the corner for front fender as shown. Add nose cap last, 1/4" x 1/2" x 1-1/2" balsa. You are ready to start carving so sharpen up your jacknife and trim off top front and rear cowls to body profile template. Note that in front, both fender and nose at centerline have same profile. Cowl line is made into a template. This is top view. Lay it on car body and draw a pencil line around it, then carve the fender line in horizontally to meet this cowl line. Carve flat apron between front fender and cowl line. Next round fenders in top view as shown. *(Continued on page 54)*



About The Most Popular Of U.S. Commercial Airplanes Of The 1920's, Travelair Was Among The First To Realize The Overwhelming Advantage Of Using The Air Cooled Radial Engine. Airways Emblazoned By Travelairs Through 1925 And 1927 However, Traced Back To The Year 1924, When Walter H. Beech And Lloyd Stearman Rented A Garage Behind The Broadview Hotel In Wichita, Kansas, And There Was Born, A 3-Place Open Cockpit Biplane, (Nº1.) Powered By A Curtiss OX-5 90 HP. Engine. In The "Christening", The Name "Travelair", Was Suggested By Walter Innes, Jr., Who Subsequently Became A Stockholder In The T.A. Organization. On Feb. 5, 1925, The Travelair Mfg. Co, Came Into Formal Being, With Beech, Cessna And Stearman As Principals, On The Front Office Door, On 11 Acres Of Ground Bordering Central Ave, On Wichita's East Side. After "Travelairing" Three Biplanes Through The First Ford Reliability Tour In 1925, Beech, As Flying-Salesman, Boosted Production From 19 "2000's" Sold In 1925, To 46 In 1926. After The Second Ford Reliability Tour In 1926, Which Beech Won For The T.A. 2000, The Blue Ribbon In The Outstanding Commercial Airplane Event Of The Year, (By Carrying 600 Lbs. Pay Load At 124.5 MPH, For Over 2600 Miles.) The "On-To-Sesqui" Race To "Phily," Prior To The N.A. Races Won By The Late Fred D. Hoyt In The Same T.A. 2000, (Covering The 2558 Miles From Eureka To Phily In 31 Hrs. Flying Time) Travelair Was On The Way. Further Significant Events Took Place, In Travelair Performance, And Re-organization Of The Company. Cessna & Beech Disagreed On The Mono And Biplane, Cessna Favoring The Former, Began Building Mono's On The Side, His Second Ship Being The First "Comm-Job" To Fly From California To Hawaiian Islands. Then Cessna Left T.A., To Organize Cessna Aircraft, And The 1927 Aviation Stew-Pot Began To Boil, On July 14-15, Smith And Bronte Cessna'd The Pacific. Then Came The Dole Pineapple Chase (Dole Race) To Hawaii On Aug. 16, 17, Which Art Goebel & Bill Davis Won In "The Woolaroc" Monoplane, Built By Travelair!

More Races Followed, Trans-Oceanic Flights, Endurance Records -- The Lid Blew Off! After Having Built Over 200 Biplanes, Beech Turned To Producing Travelair Mono's In A Big Way, Reorganizing Again In 1928. In 1927, 154 Travelairs Rolled Off The Line, In 1928, The Figure More Than Trebled And In March, 1929, More Than $300,000 Worth Of T.A.'s Were Sold. During The First Six Months Of 1929, T.A. Built, Sold & Delivered 307 Ships Costing In The Vicinity Of Two Million Dollars. By This Time, The Plant On Central Ave, Had Grown To 160 Acres. Toward The End Of 1929, Controlling Interest In Travelair Went Into The Giant Curtiss-Wright Combine, With Beech Remaining As T.A.'s President & Pres. Curtiss-Wright Sales Corp. Production In 1929, Doubled That Of 1928, With Around 1000 T.A.'s Comprised Of 9 Cabin Mono's, & 3 Open Bipes. Chief Tech' Development Of 1929 Was The T.A. Low-Wing Racer, Model "R," Known Also As The "Scarlet Marvel" Or The "Mystery Ship" Which Doug Davis Piloted To Win The "Free-For-All" In The Cleveland Air Races, Averaging 194.9 M.P.H. The T.A. Biplane Was Produced In Five Different Versions, Namely, The 2000, 3000, 4000, 8000 & 9000, Main Differences Being Engine Installation. Following Are Specs. On The 2000 Herein Illustrated:- Approved Type Nº 30. Power, Curtiss OX-5, 90 HP @ 1400 RPM. V-8, Water Cooled. Dimensions-Span, Upper, 34'-8." Lower, 28'-7½" Chord, Upper, Max. 5'-6⅛" Min. At C/L 4'-6", Lower, Constant, 4'-7⅓" Incidence, Both, 1°30'. Stagger, Average, 25½" Dihedral, Upper 0°. Lower 1½°. Max. Height At Rest, 8'-11." Level Flight Position, 9'-⅜" O.A. Length, 24'-2⅛" Track, Spreader Type Gear, 6'-6½." Weights: Empty, 1349 Lbs. Usefull Load, 833 Lbs. Gross, Loaded, 2180 Lbs. Fuel Capacity, 42 Gals, Oil, 4 Gals. Performance: High Speed, 100 MPH. Cruising, 85, Landing, 42. Cruising Range 420 To 500 Miles. For Additional Tech. Data On Models 2000, 3000, C-4000, B9-4000, D-4000, 10B Four Place Cabin Mono, See "Aviation Service & Maintenance" The Cadet Series, Nov. 1937. Also "Aircraft Yearbook" For 1928, 1929, 1930 & 1931. Also "Janes All The World's Aircraft" For 1928, & "The Story Of Travelair", Old Catalogue, 1929.


MAXIMUM SPAN. 34'-8"
GREEN NAV. LIGHT
RED LIGHT.
STREAMLINED STEEL STRUTS.
PROP. DIA. 8'-4"
STREAMLINED STEEL CABLES.
AILERON CONTROL STRUT WAS FASTENED AT TOP PERMANENTLY. AT BOTTOM WAS CONNECTED BY ADJUSTMENT TO BELL-CRANK, WHICH IN TURN CONNECTED TO PUSH-PULL TUBE, THENCE TO "STICK".
WITH ACCESS PANELS PROVIDED FOR THE PURPOSE OF ADJUSTMENT OR INSPECTION. (NOTE: HAIR'S #5398 BELOW, WAS ONCE RIGGED TO FLY WITH ONLY ONE AILERON OPERATING.) COLOR SCHEME: WINGS, STABILIZER & ELEVATORS, SILVER. FUSELAGE, V-FIN, RUDDER & WHEEL-"DISCS", WERE TRAVELAIR BLUE. TRAVELAIR TRADEMARK, USUALLY WHITE, LIKEWISE RUDDER LICENSE NUMBERS. WING REGISTRATION NUMBERS, BLACK. WOOD PROP. SHOWN VARNISHED MAHOGANY STAIN.
DINEDRAL 1½"
TRACK 6'-6½"
ILLUSTRATED BELOW IN PART, IS "Nº 1," FORERUNNER OF THE T.A. 2000 PRODUCTION MODELS OF WHICH HUNDREDS WERE BUILT. THE ONLY KNOWN DIFFERENCES IN THE Nº 1 PROTOTYPE TO "PROD" 2000'S WERE DEPARTURE FROM STRAIGHT-AXLE GEAR TO SPREADER TYPE, CHANGE IN LOCATION OF FOREMOST FLYING WIRES OR DRAG "WIRES", ENGINE EXHAUST PIPES, WING STAGGER (AS SHOWN) AND PROBABLE ABSENCE OF RADIATOR SHUTTERS. CONSTRUCTION, GENERALLY, REMAINED THE SAME, AS FOLLOWS: WINGS WERE ALL SPRUCE, FABRIC COVERED. LAMINATED SPARS, ROUTED OUT BETWEEN BOLT-HOLES TO FORM HOLLOW BOX CONSTRUCTION. SPRUCE PLYWOOD WEB RIBS AS SHOWN, WITH 3/16" GROOVED CAPSTRIPS. SOLID-CONT.
COMPRESSION WEBS WERE REINFORCED WITH SPRUCE STRIPS. TRAILING EDGE WAS ¼" STEEL TUBE. RUDDER, V-FIN & ELEVATORS, STEEL TUBE. ADJUSTABLE STABILIZER HAD STEEL TUBE LEADING EDGE. & SPRUCE FRAME & RIBS. WELDED STEEL TUBE FUSELAGE HAD TUBE CROSS-BRACING FROM THE PASSENGER'S SEAT FORWARD & Nº 10 STEEL WIRE BRACING, AFT. AILERONS WERE OPERATED BY PUSH-PULL TUBES, ACTUATING STRUTS BY BELL-CRANKS ENCLOSED IN LOWER WINGS, CONT.
CUSTOMARY LOCATION OF TRAVELAIR TRADEMARK SHOWN ON RUDDER AT RIGHT. THIS VARIED HOWEVER, AS IN CASE OF "MISS WACHI," BELOW, TRADEMARK WAS PLACED ON V-FIN WITH ONLY THE NAME "TRAVELAIR." IN OTHER CASES, USED ON FIN, IN FULL.
TRAVEL AIR
MFG. CO. INC.
WICHITA-KANSAS
C
5398
ENCLOSED ELEVATOR CONTROL HORN. INSPECTION OPENING WAS "ISINGLASS" COVERED.
ENGINE BONNET OPENED ON BOTH SIDES, SIMILAR TO ENGINE HOODS OF MOST AUTOS OF THAT TIME. HINGED ALONG SHIP ℄ & FASTENED ON EACH SIDE.
4'-0"
5'-6⅜"
2"
32⅜"
23"
1½°
NOTE CHANGE OF LOCATION, FORWARD FLYING WIRES ON Nº 1, TO LATER MODEL 2000'S
FLEXIBLE JOINT, TO ABSORB VIBRATION.
8'-11"
"MISS WACHI"
PILOT DICK HAIR.
MARION P. HAIR
SCHOOL OF FLYING
AVERAGE STAGGER
25½"
21½"
32"
14"
4'7⅝"
TUBULAR TAIL SKID SPRUNG ON SHOCK CORDS.
OVERALL LENGTH. 24'-2½"
A.P.
TRACK 6'-⅛"
STREAMLINE FAIRING
SHOWN ABOVE, IS THE NORMAL OR AVERAGE STAGGER SETTING OF THE T.A. 2000 CENTER SECTION. UPPER, THEN LOWER WING HALVES & STRUTS WERE INSTALLED & RIGGED.
AT LEFT IS SHOWN THE "STRAIGHT AXLE TYPE" GEAR USED IN THE EARLIER T.A. 2000 Nº 1. CONVENTIONAL SPREADER TYPE, AT RIGHT.
WING STAGGER OF 21½" (ABOVE) WAS BELIEVED CORRECT FOR THE Nº 1 T.A. 2000. "MISS WACHI," ABOVE, USED 25½" STAGGER.
26×4 TIRE
30×5 TIRE
10°50'
OLD GEAR, VIEWED FROM BELOW, SHOWING SHOCK-ABSORBER & ACTUATING POINT.
FIREWALL
STEEL TUBE LONGERON & MEMBERS.
SHEET METAL COWL
AFT CABANE
PLYWOOD BULKHEAD
FABRIC OUTLINE.
AA
BB
CC
DD
EE
FF
FUSELAGE SECTIONS
EACH SQUARE - 6"
SHOWN ABOVE, RIGHT, IS THE TRAVELAIR 2000 "MISS WACHI" (INDIAN, FOR BIG NOISE OR THUNDER) WHICH WAS OWNED AND FLOWN BY MARION P. "DICK" HAIR, STINSON FIELD, SAN ANTONIO, TEXAS, IN 1928, AND IN WHICH THE AUTHOR PUT IN MANY A PLEASANT HOUR ALOFT WITH DICK AT THE CONTROLS. DICK, AS HE IS KNOWN BY A GREAT MANY EARLY BIRDS AND STUDENTS HE TAUGHT TO FLY OR GAVE TIME TO, FROM JOSÉ ITURBI ON DOWN, HAS BEEN FLYING CONTINUOUSLY SINCE 1917, AFTER HE STARTED OUT BY FLYING THE WRIGHT PUSHER MODEL "B" WITH THE STINSONS. THE FAMED CURTISS "JENNY" AND DICK, WERE OLD STABLEMATES, AND AFTER THE WAR, LIKE SO MANY PILOTS OF THAT TIME, HE BARNSTORMED, THROUGH OKLAHOMA AND ELSEWHERE THAT PASTURES LOOKED GREENEST. ALONG THE LATE 1920'S, DICK SETTLED DOWN WITH TRAVELAIR, AT WICHITA, KANSAS, SERVING MOST PROFICIENTLY WITH THAT CONCERN AS A DEALER OF TRAVELAIR CRAFT. WHEN INTERVIEWED FOR ASSISTANCE ON THIS DRAWING, DICK MODESTLY, BUT FONDLY RECALLED HIS EARLY EXPERIENCE WITH TRAVELAIR AND HIS FLYING OF "Nº 1", SHOWN ABOVE, WHICH WAS THE PATTERN BUILT BY WALTER H. BEECH AND LLOYD STEARMAN IN 1924, FOR THE MANY T.A. 2000'S THAT FOLLOWED.
IN OCTOBER OF 1928, DICK WAS OPERATING HIS OWN FLYING SCHOOL AT STINSON FIELD, IN SAN ANTONIO, WHEN HE AND THE AUTHOR FIRST BECAME ACQUAINTED THROUGH THE MEDIUM OF MOST JOYOUS TRAVELAIR-ING HOURS. "DICK", IS STILL DOING BUSINESS AT THE SAME OLD STAND, AT STINSON FIELD, HANGAR 3, IN SAN ANTONIO, NOT ONLY IS HE A HIGHLY EXPERIENCED PILOT OF MOST SINGLE AND MULTI-ENGINED AIRCRAFT (ALSO FLEW FORDS) BUT HE IS ALSO A MOST EXACTING AIRCRAFT BUILDER, AS EVIDENCED BY SHIPS HE HAS HOUSED IN HANGAR 3. COMMENTING ON THE T.A. 2000, DICK AVERRED-"ONE SWEET AIRPLANE!"
THANKS A MILLION, TO WILLIAM (BILL) KEE, SCALE MODELER DELUXE, INGLEWOOD, CAL. ALSO DAVE WILLIAMS, IOWA CITY, IOWA, AND MARION P. "DICK" HAIR, PIONEER AVIATOR, STINSON FIELD, SAN ANTONIO, TEX., FOR KIND ASSISTANCE. J. NIETO.
WHITE.
BLACK.
FOK.
D-VII
WHITE.
FUSELAGE, RED, BLACK, OR SILVER, ETC.
STAB. & ELEV. SAME.
RUDDER, FIN & FIELD FOR BODY INSIGNIA, ANY LIGHT COLOR, I.E., LIGHT BLUE, LIGHT GREY, YELLO, ETC. (MOVIE JOB.)
COLOR SCHEME FOR ABOVE "D-7" OPTIONAL, AS MANY DIFFERENT, GAUDY EFFECTS WERE USED AND COULD BE CONSIDERED "AUTHENTIC."
PARTLY ILLUSTRATED ABOVE, IS ONE OF THE "FOKKER D-7'S" USED IN THE 1938 MOVIE "MEN WITH WINGS." SEVERAL TRAVELAIR 2000'S WERE FAKED UP AS D-7'S FOR THIS FILM, AS WERE LIKEWISE, IN HOWARD HUGHES' EPIC "HELLS ANGELS." IN THE LATTER, THREE REAL D-7'S WERE USED, WITH T.A. 2000'S FILLING IN AS BACKGROUND "D-7'S". MANY OF THESE USED HISPANO-SUIZA ENGINES WITH FALSE D-7 RADIATORS, HOWEVER, OX-5 POWERED "D-7'S" WERE ALSO USED. (AUTHOR'S NOTE. "HELL'S ANGELS" WAS VIEWED BY THE AUTHOR NINE TIMES, AND WAS SHOWN AGAIN IN SAN ANTONIO, AS LATE AS 1950.)
AIR AGE INC. 551 FIFTH AVE, NEW YORK, 17, N.Y.
SCALE: ⅛" = 1'-0"
FULL SIZE: ½" = 1'-0"
COPYRIGHT BY:
Joseph Nieto.
GENERAL ARRANGEMENTS & CONSTRUCTIONAL DETAILS.
TRAVEL AIR "2000"
3 PLACE COMMERCIAL 'BIPE' OF 1924-1928-

This early OX-5 Travel Air may remind you of later day Stearmans. Lloyd Stearman, formerly chief designer for Swallow, joined Travel Air as designer when the company was formed in 1924 by Clyde Cessna, Walter Beech, and Walter Innes, Jr. Cessna later famous for his monoplanes.

The Travel Air 2000

▼

by ROBERT C. HARE

Told for the first time is the colorful story of one of the great post World War I private aircraft.

Travel Air was formed in January, 1925, at Wichita, Kansas, by a group of businessmen including Clyde Cessna, Walter Beech and Frank Innes, Jr. A pilot of renown and aviation leader for many years, Beech provided the impetus that made the new organization a success from the start. His reputation attracted to the business such men as Mac Short, who became a leading engineering executive at Lockheed.

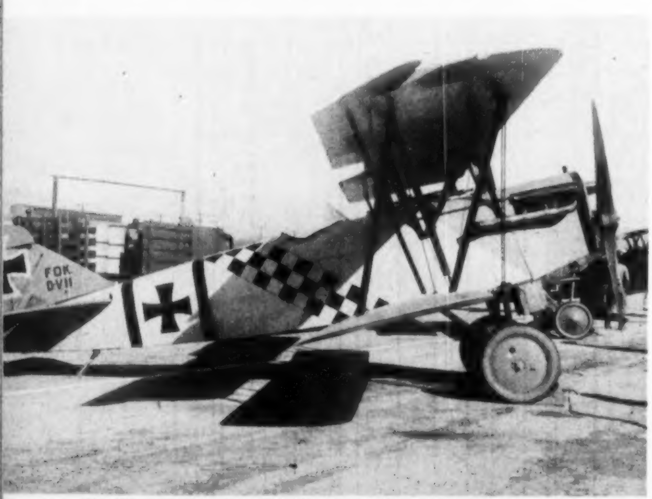
The first Travel Air biplane was purchased before it was built. Customer Numer One bought Travel Air Number One "from the board" after studying drawings and specifications. Perhaps that was just as well, because the appearance of the first Travel Air factory was hardly as encouraging as plans for the airplane that was to be built in it. The plant consisted of a room 30 by 30 feet in an old planing mill in Wichita. Everything jammed into that 900 square feet: production "line," engineering department, offices, warehouse.

While the airplane designs of any company usually are the result of a great many engineers pooling their talents, it is generally conceded that Lloyd Stearman and Mac Short were the guiding lights behind the original Travel Air.

The first ship was called Model 1000, and was designed as a replacement for pilots who had been operating air-weary surplus trainers—left over from World War I. Its configuration, that of an orthodox open cockpit biplane, was selected because it was the popular style of the day. Private pilots and light commercial operators still considered the leather jacket, scarf, helmet and goggles attire a sort of trademark. This garb was part of the "show" of early day flying: it distinguished the "daring aviator" from the lowly groundling or, as they used to say, "separated the men from the boys."

To bring the price down (OX-5 Travel Air, $2,950) the Model 1000 was powered by the Curtiss OX-5 90 hp engine. These engines were cheap and plentiful and parts were readily available. Last of all, the original Travel air was a two place ship, as were many stock *Jennies* and Standards that made up the bulk of America's private plane fleet in the mid 1920's.

The second Travel Air product, Model 2000, was the firm's first production item. Following closely the lines of its predecessor, the new ship was enlarged to accommodate a pilot and two passengers for commercial *(Continued on page* 46)



Needing fake D-7's for Hell's Angels, Howard Hughes noted the resemblance of the Travel Air. Modification shown was called "Wichita Fokker."


If it's CLEVELAND it's Good!
For Over 1/3 Century Now!
SCORPION
THUNDERJET
VOODOO
Build these SIMPLEX Jet Jobs!
(Left) 14¼" MC DONNELL F-88 VOODOO S-127
18" NORTHROP F-89 SCORPION S-128 (Top Left)
(Above) 14¼" REPUBLIC F-84 F THUNDERJET S-126
$1 Each
Today's HOTTEST Line of Dollar Models!
"Quicky" Kits 59¢ EACH
Finest Beginners Kits Ever Designed. Assemble Easily In an Hour . . . Build 'em All
Q-109 AERONCA CHIEF
Q-106 SILVAIRE
Q-94 PIPER CUB
Q-112 LUSCOMBE SEDAN
Q-120 NORTH AMERICAN F-86 SABRE
Q-108 BEECHCRAFT BONANZA
All parts in this line are die-cut, ready for quick easy assembly. Simplex models are tissue covered
18" RUSSIAN MIG-15 S-124
18" McDONNELL BANSHEE S-122
18" LOCKHEED F-90 S-121
18" VOUGHT CUTLASS S-123
20" VOUGHT CORSAIR S-79
27" PIPER CUB S-94
Build "IT" Kits
The Line For Serious Model Builders. Parts Printed Out. A Pleasure To Assemble
$1.50 EACH
30" F-9F GRUMMAN PANTHER IT-111
30" P-40 WARHAWK IT-77
30" F-80 SHOOTING STAR IT-90
24" F-51 MUSTANG IT-91
24" F-86 SABRE IT-120
30" P-39 AIRACOBRA IT-76
2 BIG GAS JOBS!
43" SILVAIRE $3.00
For ½A–A or B
READ BEFORE ORDERING
WHEN ORDERING BY MAIL: (If your dealer is out of stock) Do not accept substitutes for C-D's but order direct. Orders under $2. not accepted. (No C.O.D.'s.) Include 35c pack.-post. to all orders up to $3.50, over $3.50 add 10%. (This includes A.P.O. and U.S. Possess.) Foreign customers add 10% for special handling, etc., in addition to pack.-post. charges. Special Delivery in U.S.A. only, 35c extra. Ohio residents: add 3% Sales Tax.
21¼" FOKKER D-7 M-15 $1.75
Of World-War I Fame
CLEVELAND DESIGNED MODELS. Win More Prizes, More Honors, More Compliments Than Any Other Line Of Models In The World
$7.50
76" LUSCOMBE SEDAN GP-112
For Free-Flight – Control – Radio
6 Ft. CONDOR SOARER E-19
SOARS FOR HOURS
$1.25
70" PLAYBOY SENIOR GP-5017 $6.00
A Huge Gassie For B or C Engines
SEND 10c FOR NEW ILLUSTRATED CATALOG.
CLEVELAND MODEL & SUPPLY CO.
4509B1 LORAIN AVE. CLEVELAND 2, OHIO, U.S.A.

ANDERSON ROYAL BABY SPITFIRE

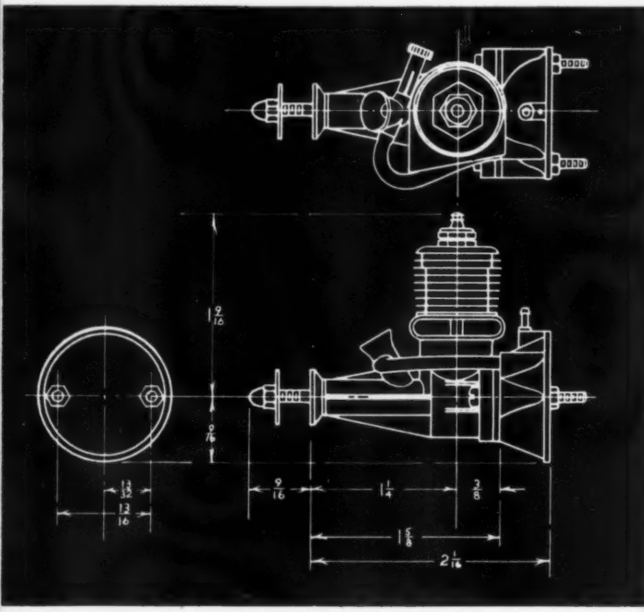
High performance and long wear are attained by a number of engineering features.

Author in his laboratory (so it looks like a work bench?), jots down his findings on Mel Anderson's latest. Engine may be seen in the stand.

engine review

by TED MARTIN

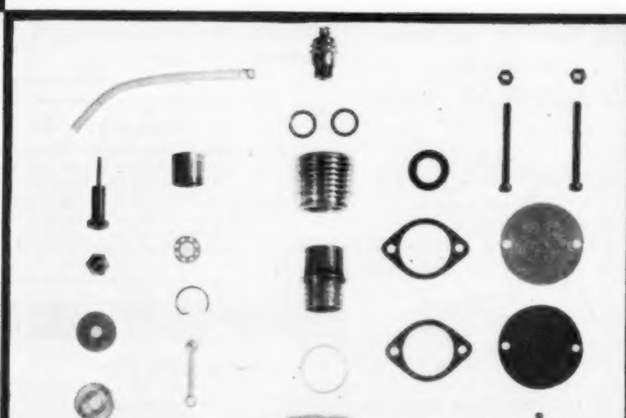
▶ Anybody familiar with Mel Anderson engine designs knows that the magic touch that began with the legendary *Super Cyke* and later produced the *Spitfire* .64, which must be among the world's best general purpose 'big' engines, has never failed to give us fresh inspiration and engine enthusiasm. The latest creation, the .049 cu. inch 1953 *Royal Baby Spitfire,* is superb. It represents



a new and thoughtful approach to the problems of cylinder distortion, exhaust direction, feed pipe location and bypass efficiency.

At first sight, the polished crankcase and pale blue anodized head immediately give a pleasing impression. Getting down to what makes it tick, we have a nicely contoured intake and a generous racing engine exhaust pointing in the traditional direction. It looks potent, and running the engine confirms this impression. Closer inspection reveals that the cylinder porting is of the 360° radial variety, which many will feel does not efficiently suit a layout with one side mounted stack for smell disposal. However, the manifold which encircles the apparently baffled ports is generously proportioned and the performance gives no indication of exhaust back pressure. For engines under .29 displacement, this setup is probably unsurpassed when correctly designed. Above this size, the opposed bypass and exhaust seem to be more efficient, again if correctly designed.

Dismantling the engine is very simple, but if the glowplug is screwed in too tightly, there is a tendency to unscrew the cylinder head instead of the plug as with all engines featuring a *(Continued on page* 39)



official news

by RUSS NICHOLS and CARL WHEELEY

First details of the 1953 Nationals to be held near Philadelphia • Complete rundown on new AMA records • Specifications of the record breakers • FAI records • A Contest Calendar

'53 NATS NEAR PHILADELPHIA. Continuing the plan for rotating the National Contest from one section of the country to another, the outdoor events of the 22nd National Model Airplane Championship Contest will be held at U. S. Naval Air Station Willow Grove, Pa., just north of Philadelphia, and the indoor events will be flown in one of the spacious airship hangars at the Lakehurst, N. J., Naval Air Station. Dimensions of the airship hangar are 1,110' long, 200' wide and 187' high! This is the place where those indoor records of over 30 minutes were set. Willow Grove has three 4,000-foot runways.

The big contest, scheduled from July 27th to August 2nd, is to be sponsored by The National Exchange Club, sanctioned by AMA, and has the full cooperation of the United States Navy. The interest and cooperation of the Navy in our National Contest is explained by Rear Admiral Thomas S. Combs, Chief, Bureau of Aeronautics, U. S. Navy, who said, "There is a definite tie-in between air power and model aviation. The boys who fly the model airplanes today will become our aircraft designers and technicians of tomorrow."

Tentatively, indoor events are planned for the first day, July 27th, and outdoor events on the remaining six days. Before long we'll be able to let you know what the events will be, on what day they will be flown, housing arrangements, and many other details.

NEW F.A.I. RECORDS. *Flying Wing Gas Models, Control Line Speed, Class I*—165.708 km.p.h. (102.966 mph). Record established by Leonard Peter Wright (Great Britain) on August 10, 1952, using an E. D. glow plug motor of 2.42 cc. displacement.

Orthodox Models, Jet-Powered, Control Line Speed—245.052 km.p.h. (152.268 mph). Record established on July 13, 1952, by Zdenek Husicka (Czechoslovakia), using a model powered by a Letmo-MP motor.

Special Aircraft (having movable lifting surfaces). Duration — 4 min., 20 sec. Record established by John O'Donnell (Great Britain) on April 22, 1951.

Special Aircraft, Distance — 1720 meters (5643 feet). Record established by John O'Donnell (Great Britain) on April 22, 1951.

AMA RECORDS. The following will bring your listing of 1952 AMA records up-to-date.

Indoor Rubber-Powered Stick Models, Class B Junior — 21:08.2. Record established by Ronald Cummings, Los Angeles, Calif., on July 28, 1952. The model, designed by Ronald's father, Frank, has an elliptical wing with projected span of 24-1/2" and center chord of 4-7/8"; elliptical stabilizer with span of 9-1/2" and chord of 3-3/8"; disc rudder aft of the stabilizer of 2-1/2" diameter; fuselage stick length of 11-3/4" and boom length of 8-7/8"; and 14"D x 28"P prop. The weight of the model, less rudder, is .033 oz. 1600 turns are put into the 17" loop of pre-war 1/16" brown rubber.

Indoor Hand-Launched Gliders, Class B Junior—0:56.4. Record established by Jerry Robertson, Phoenix, Ariz., on July 28, 1952. The model, a Dick Everett design, has a 20" wing span by 3-1/2" chord with polyhedral and and elliptical tips. The airfoil is flat-bottomed and is 1/4" at the thickest point. Fuselage length is 20-1/2" with 4-1/2" being in front of the wing. Stabilizer is built from 1/16" sheet and has a 7-1/2" span by 2-1/2" center chord. Rudder, also of 1/16" sheet, is 1-3/4" high by 1-1/2" wide. No incidence is used in either the wing or stab.

Indoor Hand-Launched Gliders, Class B Senior—1:04.2. Records established by Don Alberts, Albuquerque, N. Mex., on July 28, 1952. The model, called *Privy Launch*, is a design of Paul Callies, Jim Taylor, and Don Alberts. Wing span is 18", wing chord is 3", and thickest point on the flat bottom airfoil is 1/4". Polyhedral and elliptical tips are used. Stabilizer is 1/16" sheet with 9-1/2" span by 3" chord. No incidence in either wing or stab. Fuselage length is 18", 3" of which is in front of the wing.

Indoor Hand-Launched Gliders, Class B Open—1:14.0. Record established by Joseph Foster, Jr., San Jose, Calif., on July 28, 1952. Most unique feature about Joe's design, besides the consistently high times he turned in with it, is the airfoil in the wing and stab. The airfoil is almost a perfect triangle with the thickest point, 1/4", being back about 1/3 from the leading edge. The wing has polyhedral, elliptical tips, 17" span, and 4" chord. Stabilizer span is 6" and the center chord is 3". Rudder is 2" x 2" with elliptical shape. Fuselage length is 21-1/2" with the nose moment being 4-1/2".

Outdoor Hand-Launched Gliders, Class A Junior—11:14.0. Record established by Jimmy Jackman, Oklahoma City, Okla., on July 30, 1952. Jimmy's model, *Fugan* designed by Ray Matthews, is the same design which holds the Senior and Open Class A Outdoor Hand-Launched Glider Records. It has a 16" wing span and 4" center chord; 7-1/4" stabilizer span by 2-3/4" center chord; and 17-5/8" fuselage with 3-3/8" nose moment.

Towline Gliders, Class C Senior — 7:51.0. Record established by Jim Baltes, North St. Paul, Minn., using a *Thermic* 50 glider.

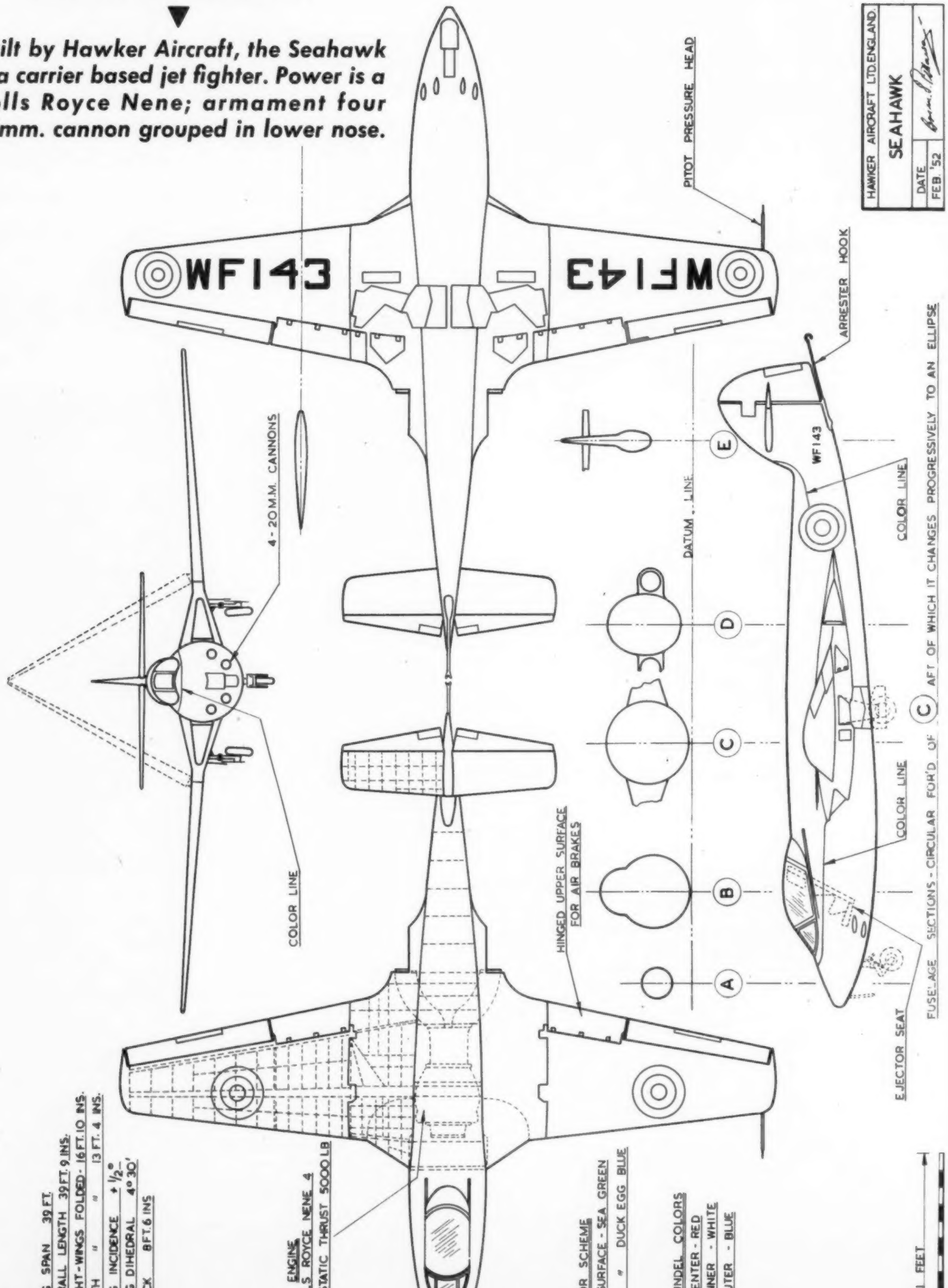
Towline Gliders, Class C Open — 10:18.0. Record established by Thomas H. Henebry, Chula Vista, Calif., on July 29, 1952. The model, Henebry's own design named *Tomag*, has a 57" span (not projected) by 5" center chord. The tips of the wing are tapered to 3". No undercamber is used in the airfoil. Stabilizer span is 16-1/2", the center chord is 5", and the tip chord is 3-1/2". Overall fuselage length is 35". Twin tip rudders are used on the stabilizer.

Wakefield Rubber-Powered Models, Open—15.00.0. Record established by Thomas R. Quermann, Bayside, N. Y., on August 1, 1952. Quermann's model, his own design, has a wing span of 41", chord of 5-1/2", and rectangular planform stabilizer span of 19", chord of 3-5/8", and rectangular *(Continued on page 52)*

British Seahawk

▼

Built by Hawker Aircraft, the Seahawk is a carrier based jet fighter. Power is a Rolls Royce Nene; armament four 20mm. cannon grouped in lower nose.



Engine Review

(Continued from page 36)

boltless assembly. The moral is that, since soft copper plug washers are provided to enable a gastight seal to be obtained without much torsion, it is not necessary to do more than screw the plug in finger tight and just nip it up with the wrench. This goes for all engines. A great many cylinder head threads are stripped by people religiously leaning unnecessarily on a wrench that they probably also use for prop fitting.

One of the most striking constructional features of this engine is the method employed for retaining the cylinder. There are no threads on the cylinder barrel but instead, the port belt flange sits down on a shoulder in the crankcase with an aluminum distance piece between the joint. The cylinder head is then screwed into the top of the crankcase casting and bears down on the upper rim of the cylinder barrel, with a gasket between to form a gastight joint. This principle of sandwiching the cylinder also ensures an equally good joint at the bottom pressure point. Since in practice the cylinder expands more than the head when running, because it is considerably hotter than the difference in coefficient of expansion of the head will compensate for, the joint simply tightens up when the engine is running. Thus there is no apparent tendency for the assembly to loosen with vibration as with most other methods of assembly.

The greatest advantage of all lies in the fact that all stress is sustained axially down the cylinder walls. The bore is therefore practically free from distortion whereas, with the popular method of threading the cylinder barrel itself, the very nature of the Vee thread form is such that one third of the axial load becomes radial load and inevitably distorts the cylinder when tightened. Since the glowplug is essentially part of the cylinder, the act of tightening the plug excessively can squeeze the cylinder to an extent where it grips the piston and damages the entire engine.

When purchased, this motor was equipped with two plug washers, with the purpose of providing a slightly lower compression ratio during the first few minutes running. Once the motor has completely loosened up, one washer can be removed for maximum performance. Although it is not recommended, the aluminum distance piece located under the port flange of the cylinder, lends itself to the ministrations of those who like to experiment with their engines, because increasing or decreasing its thickness will advance or retard the valve events.

One of the most important factors affecting the performance of these tiny engines is the efficiency of the crankshaft bearing. The fit and finish have to be of the highest order. Ordinary production grinding of the shaft and the reaming of the crankcase bearing, as normally applied to larger engines, is seldom adequate in miniature. In this particular case, the *Spitfire* engineers have obviously taken the problem very seriously. The crankcase bearing is wet honed by a process which permits accuracy within .000025 inches and a finish of 3 micro inches; in other words, it amounts to a super-accurate polish. The crankshaft is hardened and ground and, although the grinding is apparently done by the centerless method, the finish is exceptional. The diametric clearance between bearing and shaft is about .0001 inches, which gives a free running bearing with no leakage or play in operation.

The rotary valve port and gas passage in the crankshaft are generously proportioned and well finished, and the circular crank web is chamfered to provide clearance for the piston skirt which overlaps the web at B.D.C. This means that the crankcase volume, and therefore dead space which tends to reduce charging efficiency, has been kept to a minimum.

This also has been shown to be pecularily important in baby engines. The larger high performance motors, on the other hand, often breathe more easily when the crankcase has a slightly greater volume than appears necessary or desirable.

The carburetor on this engine is a tangent downdraft type with an unusually large throat diameter for an .049 displacement; the rake forward provides a slight boost to breathing and volumetric efficiency because the incoming mixture is diverted through a smaller angular change in direction than would be the case with the normal vertical type. Also, there is the theoretical advantage of slipstream assistance.

The needle valve assembly is swept back to provide thumb clearance, and the spraybar type jet is pressed into position so that the right hand may be used for adjustment from behind the engine and, as the exhaust is located on the opposite side, the hands remain clean.

The connecting rod is machined from duralumin bar and features a ball and socket "small end" bearing and conventional "big end". This universal joint is achieved neatly and very effectively by locating the ball-ended rod in a recess in the piston and retaining it with a disc, perforated for lubrication and lightness, which is in turn retained by a circlip seating inside the piston. The advantages of this arrangement are, first, that the assembly can be easily stripped and reassembled; therefore, it is not necessary to replace a complete piston cylinder unit in the event of damage, as is the case with several other engines incorporating a ball joint. Further, the total reciprocating weight is very low, resulting in low inertia losses which materially influence high rpm. The basic advantages of this type of joint are that the wrist pin ends and holes are eliminated, thus avoiding a possible source of cylinder wall wear and leakage path for the compressed charge past the piston. Also, and most important, it compensates for the slight misalignment which is impossible to avoid completely in any production engine, and which has such a marked effect on performance, particularly in very small engines where the torque is low and power produced only at relatively high rpm.

The crankcase, rear cover, and fuel tank are cast from aluminum alloy containing a high proportion of silicon, copper and other metals which produce excellent bearing properties, thus eliminating the need for the usual heavy bronze bushing. After production by pressure die casting, these parts are tumbled to a high polish, but with no detriment to their clean-cut appearance.

The crankcase radial mounting lugs are exceptionally sturdy and no trouble is likely from the heaviest crash, while the heavily webbed main bearing goes to make up a unit which is far stronger for its size than the average large engine. The fuel tank and recessed rear cover make up a high fuel capacity which is ideal for big low performance, scale free flighters; for duration models, the capacity may be limited with filling pieces without the danger of blocking the pickup tube. If a different tank is required, the standard tank is easily detachable, but the special fuel pipe location lugs make the standard tank difficult to improve upon for most purposes. A tube connection is fitted to facilitate refuelling.

The duralumin prop driver is pressed onto a straight knurled portion of the shaft and butts up against a shoulder, so that there is no danger of jamming the assembly by overtightening the prop. The diameter is ample and no trouble was experienced with prop slippage, as in the case of some small engines where weight economy has been somewhat overdone. A cap nut is fitted for retaining the prop and, in this case, has sufficient range of adjustment to cover all the different thicknesses of props that may be usefully fitted. The bolts which retain the rear cover-tank assembly are also used for mounting, and are of sufficient length to permit the use of up to 5/16" firewalls without bolt substitution.

Our only criticism of this engine is the excessive vibration induced by the long overhang between the cylinder centre line and the mounting points when the standard tank is used. However, this fault is common to most AA engines featuring this tanking arrangement and, since nobody has come up with a neater or more convenient setup, the *Spitfire* is in no way worse than any other engine in this respect. This vibration comes in periods between a definite range of rpm, depending upon the type of mounting material used. The solution is to use a firewall that is really rigid, and we suggest not less than 1/8" thick.

Allowing the engine to vibrate, incidentally, costs about 2,000 rpm and tends to cause excessive wear throughout the engine, as well as being dangerous in the sense that the bolts will quickly fatigue.

Apart from this, the new *Royal Baby* is a joy to handle, having no vices whatever. Starting is easy and requires no priming. Once fuel has reached the jet, with the needle five or six turns open, a choked flick and a couple unchoked usually give a clean start. The first unchoked flick won't do it because that stroke is needed to get the juice up the bypass into the cylinder. Don't be fooled by this into overchoking because, once flooded, the *Spitfire* is like any other baby engine and gets fussy.

Needle valve control is delightful, being absolutely positive, and gives a running range of at least three complete turns.

Test: Anderson Royal Baby Spitfire .049 (1953); Bore — .396"; Stroke — .406"; Weight complete — 1.06 ozs.; Plug — Spitfire (1-1/2 volts to start); Fuel — O & R AA; Running time prior to test — three hours.

Power Prop	*RPM*	*Top Flite*	*RPM*
6 x 5	9,500	6 x 5	8,000
6 x 4	10,500	6 x 4	10,100
6 x 3	13,000	6 x 3	11,500
5-1/4 x 4	13,200		
5-1/4 x 5	11,500		
5-1/4 x 3	15,500		
Spitfire Prop (as fitted)			13,000

From these figures, it is evident that the engine begins to really perform at speeds above 12,000 rpm, and that the peak of its power curve lies up in the 14,000 region, where it will be producing about .055 b.h.p.

It is also evident that there is no point in loading the engine below 11,000, as the power falls away very sharply below this speed, and that a narrow bladed 6 x 3 or 5-1/4 x 4 give approximately the same speeds as the standard *Spitfire* prop supplied with the engine.

In conclusion, it might be mentioned that, although the engine had run for some three hours prior to readings being taken, it still had a tendency to lose speed slightly as it got really hot; also, that measurements taken after the test showed no difference from those taken before that could be described as wear. One can therefore expect exceptional life for the *Spitfire* AA engines and not a worn out engine after some ten hours running. Also, the performance will probably improve steadily during the first five or six hours, after which it will continue for a long time at its peak. Finally, on the standard prop, the improvement after removing one of the plug washers was about 500 rpm and starting was even easier.

FREE FLIGHT FANS!

Tired of little jobs? Want something sensational in big ships? See the March MODEL AIRPLANE NEWS for *Long Tom 60,* by Capt. C. J. Bryant. It's a frequent winner and is one long moment arm design that beats the wind.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The Lorenz Receiver

(Continued from page 25)

three feet #20 enameled wire; one foot 4-wire cable (four separate wires may be used; one 3/8" wide strip of aluminum or brass for tube holder; one #4 self-tapping screw for tube holder (this item not pictured).

Note that all condensers are of ceramic type, including bypass and coupling condensers, in order to prevent leakage.

Figure 2 is a full size layout of the base, which is made from 1/16" micarta or similar material. Cut to size and drill as shown. Install eight flea clips for the two tubes and four eyelets as shown in Figure 3.

The tank coil, Figure 4, is constructed around a CTC 3/8" coil form or around one of the special forms handled by Control Research. Winding is of #20 enameled wires and consists of 17 turns, started 5/16" from top of form. Make certain wire is free from kinks and is perfectly straight. Pull wire tightly in winding to assure a tight, even coil, making sure that each turn is snugly against preceding one. Bend leads at each end as shown and cut to 1". After checking to see that winding is located correctly on the form, cement in place, using clear finger nail polish or collodion (obtainable at drug stores). When dry, carefully scrape insulation from ends of wire and then wind antenna coupling coil around tuning coil, using either #20 enameled wire or some of the thin plastic insulated wire sold in radio shops. Solid wire is preferred. DO NOT CEMENT IN PLACE; this is done later in final adjustment. Solder the 15 uuf tubular ceramic across leads of tank coil. Mount coil form in the 13/32" hole (Figure 3), pushing in until "ears" spring apart on top, thus preventing form from pulling out. The condenser should face the flea clips' end of the chassis.

The cable, or individual wires, are inserted in the 5/32" diameter hole and after ends have been stripped 1/8", they are connected as shown in Figure 5 and 9. Note that outside clips are used for plate connections for each tube. Next, the 10 microhenry choke is placed in position pictured in Figure 6, between plate clip and one eyelet. Do not solder eyelet end at this time. Do solder the 47 uuf tubular ceramic between plate clip (one end of 10 uh choke) and lead of tank coil nearest chassis. Place the 2.7 megohm resistor in place between grid clip of first tube and second eyelet at opposite end of chassis. Again, do not solder eyelet end. Solder the 100 uuf tubular ceramic in place between grid clip and bottom end of tank coil. Figure 6 shows these connections. Run a short piece of insulated wire from eyelet at the end of the 2.7 megohm grid resistor to junction of the inside flea clips. Following on with Figure 6, place the .01 bypass condenser between the two eyelets. Before soldering these eyelets, place the 3000 ohm resistor between outside eyelet and the one at other end of chassis. Now, solder these two eyelets. The antenna coil connections are inserted in their designated eyelets. The antenna lead closest to the chassis goes to eyelet at far side of chassis. Before soldering this connection, insert a 6" length of stranded wire in the eyelet. This is the antenna connection from receiver to plane's antenna. The outside antenna coil lead is soldered to second eyelet at junction of the .01 condenser and the 2.7 megohm resistor.

The .005 uf of coupling condenser is soldered at junction of the 3000 ohm resistor, choke, .01 condenser and the other end to grid connection of the second tube. This connection is the third flea clip from the outside, or second tube.

Strip wires from the other end of cable and solder into pins on four-prong plug. Be sure to label wires correctly so correct connections can be made at socket. Figure 9 shows flea clip and eyelet connections to cable.

This receiver has been designed to use the RK-61 tube in the first stage. Once the antenna

coil has been positioned properly and frequency adjusted correctly, there are no variables throughout the life of the tube, other than an occasional check on the first stage plate current. This is done by varying the 25K potentiometer. Experimental models of this receiver were left on for extended periods of time with no readjustment except to see that the "A" battery did not fall below 1.2 volts. These time periods have exceeded 26, 40, and 52 hours on separate occasions, using the same tube for each of the three tests. All that was needed at the end of the 40 and 52 hour periods was a replacement of the 1-1/2 volt "A" battery, a Burgess TE cell.

Before making an installation of this receiver, it is suggested that it be connected as shown in Figure 8 for bench testing. It is preferred that an 0-1 ma meter be used for first stage testing although a *good* 0-3 ma meter may be used. Connect receiver as shown but do not connect the "B-plus" to the second stage. Be sure that the 25K potentiometer is turned to its full resistance. This will place 28,000 ohms resistance in the plate circuit of the first stage which should then draw from .2 to .5 ma. Attach a 20" length of wire to antenna lead and position antenna coil about one-third of the way up from grid end (the 100 uuf capacitor) of tank coil. Now tune receiver to 27.255 mc by varying the brass screw on the powdered iron slug. Upon hitting resonance, current will drop to .1 ma or less. In addition to using a meter, a pair of low resistance headphones, about 2000 ohms, placed in series with meter, is an excellent means of obtaining proper settings for optimum performance. A local "ham" or radio shop should be able to supply a set for initial testing. A loud, coarse hiss which is fairly stable and steady in strength indicates optimum operation for this receiver. Positioning antenna coil will bring about this position; at the same time, there will be a slight fluctuation of the meter needle, approximately .01 ma. If antenna coil is too near the plate end of the tank coil, maximum sensitivity may not be obtained. If it is too near the grid end, antenna will tend to overload the receiver and knock it out of oscillation. Vary the 25K potentiometer to obtain a reading of .4 to .5 ma. If your RK-61 is new, it may not fall to .5 ma even with full resistance in circuit. In this case, run plate current up to 1 ma and let the tube idle at this setting for about 20 minutes or so, checking occasionally to see whether .5 ma can be obtained. When the first stage is operating properly, connect the "B-plus" to the relay of the second stage. An 0-3 or 0-5 ma meter may be placed in series with the relay so that the change in plate current may be observed. This, however, is not needed in plane installation. When no signal is being received, the first tube will idle at .5 ma and the second stage will indicate a zero reading. If the second stage goes to 2 ma or more, it indicates either that the .005 coupling condenser is bad, or the first stage is too heavily loaded. To correct latter, move antenna coil toward plate end of tank coil a little bit. Upon receipt of a signal, the first stage will drop to .1 ma or less and second stage will rise from zero to 1.8 ma or more, depending on resistance of the relay. Since the second tube is conducting only while a signal is being sent, which is a very short time, it is best to allow full current of 1.8 to 2.5 ma to be drawn. However, if it is desired to keep current around 1.5 ma in order to prolong the life of the "B" battery and second tube, a 10K potentiometer may be placed in series with the relay and adjusted to obtain correct current.

By operating relay from 0 to 2 ma current, the spring tension on the armature and the contact spacing may be increased for additional vibration resistance. In connecting relay for this set, note that the normally open contact is used. This is opposite to standard use of the normally closed contact on regular receivers.

In making your installation, allow for a meter jack in the first stage and a switch to cut the A-plus, B-minus lead from the batteries. The receiver may be mounted solidly in the plane, but relay should be shock-mounted on a Lord mount, as described in the October, 1952 M.A.N. The relay should be shock-mounted preferably on firewall of the plane although it may be installed in a similar position elsewhere.

The installation in a plane, boat, or car will include the following: the socket for the cable plug, a 1-1/2 volt filament supply, the 45 volt plate supply, a relay, the 25K potentiometer, a closed circuit jack in the first stage plate lead for plugging in the 0-1 ma meter, and the desired actuator and power source. The batteries, receiver, and associated components may be mounted solidly, the relay being the only shock-mounted item. In a boat or race car, even the relay may be mounted solidly. Use standard wire for connections in the hookup. DO NOT USE ACID CORE SOLDER. Keep wiring neat.

This circuit has been built, in various physical layouts, by both experts and novices, and operation has been almost perfect in all cases.

Scrap Box

(Continued from page 4)

Meidad Abir of Tel Aviv, Israel, sent us a "poop" sheet for the second All-Israel Competition. Great improvement this year. Free flight, rubber, and u-control jobs by the car load. Over 100 hopefuls gathered and the competition was excellent. Seems the American designs are very popular. A Mac 29 powered *San De Hogan* took first in F.F. with 22 minutes. The job was built and flown by S. Bralshtein of Jerusalem. M. Abir placed second with an original Mac 19 powered job. About 60 sailplanes competed in the glider class with Z. Borkay totaling 12:34 for first place. U-control speed jobs clipped former records with M. Abir clocking in at 139.3 kmh with his original Mac 29 powered speedster. S. Bratshtein and U. Elner placed second and third with 121.5 and 98.2 kmh respectively. Looks like the modelers over there are a bit partial to American powerplants, also.

* * *

The Kokomo *Flying Wildcats'* newly appointed publicity officer, Max E. Mullen, dropped us a few lines about the club's activities. The club has over 140 members with youngsters of six years building and flying their own u-control jobs. Activities cover every phase of modeling from H.L. gliders to 9' R.C. jobs. Regular classes are held to teach new members the fundamentals of flying and model construction. Meetings are held in their own well-equipped workshop every two weeks. City organizations give wonderful co-operation (brother, is that lacking in plenty of cities we know about!), and the Jr. Chamber helps these lads plenty. One of the fine flying fields in Indiana was donated by a local merchant, who deserves a plug. The Wildcats have a well-qualified board of officers who keep the club and its activities running smoothly. Bruce McPherson wields the gavel at meetings. Suggest any of you clubs that would like some good information write to Max E. Mullen, 213-1/2 W. Elm St., Kokomo, Indiana.

* * *

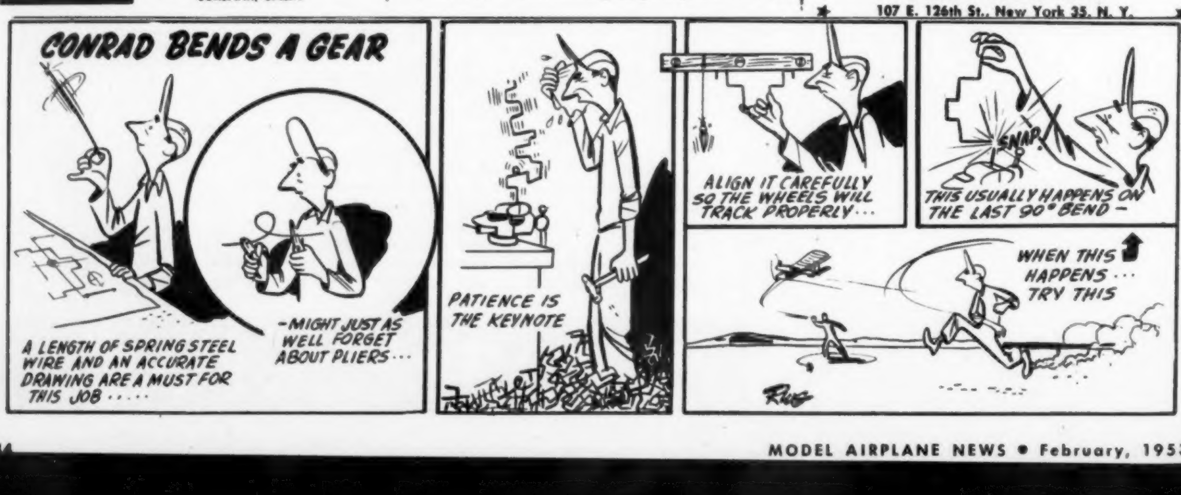
More of the top-notch fliers are going into the service. Larry Goodale, a good friend of ours, put his bid in for the Air Force and left a short time ago for a base in California. Merle Hoyt, husband of Violet "Jet" Hoyt, has left for Korea.

* * *

The *Tucson Thermaleer* annual Model Plane Roundup will be held January 24 and 25, 1953. They have 56 engraved trophies, 34 medals; the trophies to third place, medals for fourth and fifth. Free flight events on Sunday, the 25th, with U-control flying scale, jet speed, combat. U-control on Saturday, the 24th. The contest will be sanctioned and held at the same field as last year.

* * *

We've had numerous requests to tell a modeler how to fly a u-control model. That's quite a chore, fellows. First, talking and doing are two very different things. However, go to your local hobby shop with another modeler who knows something about u-control and pick out a good proven stable ship. Build it per plans and be sure to check every step. Watch for warps, etc. When the job is ready for the tank, get some help. Nothing more disgusting than to finish a swell looking job only to find that the tank leaks, or is plugged. Watch your engine mounting. Be sure it doesn't point in at all. When the job is ready to go into the air, GET A GOOD FLYER TO FLIGHT TEST IT FOR YOU! If anything is wrong,



he'll find it and you can fix it before you take a whack at flying it. Don't grab a neighborhood kid who has never seen a model fly and run to the nearest open field to fly it yourself. In nine out of ten cases, you'd be better off to jump on the ship first. At least, you wouldn't have to roll out the lines and then take the kinks out of them when you picked up the pieces.

If everything is OK, get your buddy to take the handle again and get the ship in the air for you. Stay in the circle with him for a flight standing alongside of him. Keep your eye on the ship (keeping out of his way) and turn with the model. Sure, you'll get dizzy but you can sit the flight out if you start staggering. After a few of these sessions, try your hand at holding the handle with his hand over your for a few laps. A good teacher will relax enough on the handle to let you get the feel of the ship. The higher the ship flies, the dizzier you'll probably get, but your teacher's guiding hand can take over and save a "prang" much quicker if you have this needed altitude. Soon you should get the feel of the ship and more laps should be logged each time. It shouldn't be too long before you will be able to get in a whole flight after the ship is in the air. Take-offs are not too hard, but, with the wing area on most stunt jobs (if you are learning on a stunt job), landing is a bit tougher. Keep your ship near the ground after the engine has stopped and don't try to land it before flying speed has been lost. It won't be long before your whole flight can be made without too much trouble. You'll lose props and bend landing gears, so don't get discouraged. It's when you think you are getting good that you have to be careful. Always try to pick a day when the wind is down for those first flights. The wind is plenty tricky, as any flyer can tell you.

Getting back to that tank, watch the line to the metering jet. See that it is clear. Check the fill and overflow lines to see that they too are clear. We recommend that if you are making your own metal tank, you never use acid in the copper tubing, which allows corrosion to start and a line will plug plenty fast if you don't watch it. Resin core solder is what we use. It's also a good idea to fill your tank with methanol once in awhile to wash out the goop of the fuels you've been using. Some of today's glo-fuel will corrode the lines a bit if left standing. Especially those of home concoction. Same thing applies to the engine. Wash it out once in a while. If you don't believe us, check one of your engines that has had some potent concoction in it and hasn't been run for some time. That reddish gunk on the piston isn't peach juice. In other words, keep it clean.

Try Pendulum Control

(Continued from page 26)

planes. In this case, the pendulum is somewhat heavier than for rudder control, but it can be placed near to or on the CG of the plane. Movement of the scale portion of the tailplane is similiar to a control line job, the swing of the pendulum being checked by a short length of thread fixed to the fuselage. With these jobs rudder trim is very fine and requires some positive vernier adjustment in place of the usual trim tab.

One of P. E. Norman's latest jobs is a Percival *Mew Gull* of about 40" span. Using a 3.46 cc E.D. diesel, (0.21 cu. in.), and pendulum elevator and rudder for control, the flying speed of this plane is very high. Since these high power jobs, which weigh two or three lbs. sustain many high speed landings, they have to be built very strongly with most parts "knockoffable", (see photo & Fig. 5).

I have been doing some experimenting with pendulum elevator control on free flight power jobs. The idea was to provide a very snappy take-off combined with a steady straight climb. This would be an advantage in a wind, as the plane wouldn't be half way down the field when the engine cut. A 48" span pylon job was used, with the pendulum in the pylon having a limited range of swing of from 15° to 90° from the horizontal, so that the pendulum wouldn't operate on the glide. (See Fig. 6).

The original model, when launched horizontally, quickly went into a vertical climb and leveled out to about 70° to horizontal. The pendulum itself was quite satisfactory, but I noticed that if the plane had any turn on the climb the elevator tended to act as rudder and cause some rather violent maneuvers. To date, I haven't had opportunity to continue this further, but I think it may have possibilities, especially if fitted to a shoulder wing job.

Aileron Control: Another modeler of the P. E. Norman school is D. P. Golding. His planes are pendulum controlled by means of independent scale size ailerons which are fitted on models with little or no dihedral. (See Fig. 7). His Comper *Swift* of 36" span, powered with an Elfin 1.49 cc diesel (0.09 cu. in.), also has pendulum elevators as well as the ailerons, and his 52" span 2 cc powered Miles *Hawk Speed Six* uses pendulum rudder with the ailerons.

On bipes and tripes, the aileron control surfaces are usually placed on the top wing only, the pendulum working them from the fuselage via push-rods and bellcranks (See Fig. 8). On a scale model, I personally believe the aileron control to be the most effective, but naturally this depends on the inherent stability of the plane and all the above controls have been tried with complete success.

If I may make a point here, do not expect any auto-control to make a plane fly straight off the drawing. Many trimming flights are necessary to get the full benefit of the auto-device but the result is usually well worth the effort. END

The Travel Air 2000

(Continued from page 34)

work and was fitted with dual controls for use as a trainer. OX-5 powered, its top speed was around 100 mph, it landed at about 40, climbed 600 ft. the first minute. Service ceiling was listed as 10,000 ft., and cruising range as 500 miles.

While Model 2000 carried a bigger payload and traveled at a substantially higher speed than, say a Jenny with the same powerplant, higher performance was of course the next item of improvement. Except for minor changes in structure and cowling contour at the nose, the improved version, Model 3000, was the same as the 2000. Power was increased to 150 hp by installing the Wright Hispano-Suiza model A powerplant. Top speed rose to 105 mph, it landed at 43 mph, climbed 900 f/p/m, had a ceiling of nearly 15,000 ft., and a range of 550 miles.

Further improvement in performance was achieved by installing the 225 hp Wright *Whirlwind* J5 engine. This version of the basic airplane became Model 4000. Top speed was boosted to 130 mph; climb, 1,200 f/p/m; ceiling was 20,000 ft. and range, 600 miles. Other engines, including the Lycoming, Continental, Warner, Caminez (experimental) and Curtiss Challenger, ranging from 125 to 300 hp also were fitted.

Although design of the Travel Air Model 2000 took advantage of all the economies, configuration and occupant arrangement popular in the 1920's, the ship exhibited the very latest methods of construction for the day. It was one of the first civilian production light planes to take advantage of steel tubing for the basic fuselage structure. A chrome molly was used. The four longerons were connected by uprights and cross pieces of the same material welded at intervals. Diagonal bracing between upright and cross bays forward of the front cockpit was welded tubing, but aft Number 10 steel wire was used in the conventional manner.

Fuselage bottom surface was flat, but the sides were faired by three longitudinal spruce stringers. Upper surface after the rear cockpit was heavily rounded by stringers over formers all the way to the sternpost. Contour at the cockpits was preserved in sheet aluminum. Passengers and pilot were well protected from the wind by large windshields. While the front cockpit (for two passengers) was equipped with a low door on the left side to simplify getting in and out, the pilot was obliged to climb in the "old fashioned" way.

Sheet aluminum was used to cowl the balance of the upper deck forward to the firewall. The entire engine section was neatly cowled in aluminum in several sections quickly detachable to allow easy access. In the OX-5 and Hispano-Suiza models, the cowl section over the top of the engine was neatly formed over the cylinder banks. Depressed between the banks, the cowl gave the pilot an excellent downward view over the nose. Propeller hub was finished off in a neat spinner.

On both OX-5 and Hisso models, engine exhaust was eliminated in several ways. Both short and long straight and back-slanted stacks were widely used. Another form consisted of long "tail pipes" leading downward from the manifold collectors, past the leading edge of the lower wing and below it. Another variation was a short horizontal pipe leading from the manifold collectors only a foot or so. In ships so equipped, it was a good idea for passengers to wear ear plugs in addition to the regular ear pads inside their helmets!

Much of the good performance of the Travel Air Models 2000 and 3000 was due to the very clean fuselage nose, compared, for example, to a Jenny. Travel Air achieved this cleanliness by installing the radiator under the nose at the bottom of the firewall. Its small size was remarkable compared to the area of a Jenny radiator for the same engine.

The Travel Air landing gear began as the simple, straight axle and spreader bar type, widely used for years. This type had the disadvantage of occasionally snagging heavy grass or dirt clods on rough fields, sometimes causing a plane to nose over. Travel Air pioneered the split axle type with proper ground clearance. Material was streamlined steel tubing with rubber cord for shock absorbers.

Flight surfaces of the Travel Air biplanes were of mixed construction. Tail surfaces were largely 1/4" dia. welded steel tubing except for the larger spar members. The horizontal stabilizer was adjustable in flight for trimming purposes and the vertical fin was adjustable on the ground for torque counteraction. Rudder was aerodynamically balanced, but elevators are not. Overall length of the Travel Air 2000 was listed as 24 ft. 2 in. The J5 powered Model 4000 was slightly shorter: 23 ft. 6 in. overall.

Travel Air biplane wings were made in right- and left-hand upper and lower panels. Upper panels were attached to a center section supported from the fuselage by streamlined steel tubing "N" struts; lower panels attached to fittings on the lower longerons.

Except for a 1/4" dia. steel tube trailing edge, wings were made entirely of spruce. The peculiar method of attaching the trailing edge tube — just forward of the rib trailing tip — caused the fabric covering to pull to the tubing and give the impression of a wire trailing edge.

Each wing spar was a box section made of two solid pieces routed out between bolt hole positions, then glued together to form a hollow laminate. Ribs were built up of three plywood webs, lightened between spars, and held together by 3/16" grooved capstrings, wood blocks, nails and glue. Compression rib members served as regular ribs, were built of heavier plywood and not hole-lightened, but with additional stiffening strips.

Wings were tied together by one set of steel tube "N" type interplane struts on each side plus the usual lift and drag bracing, the latter in the form of streamlined steel rod rather than cable.

Ailerons, aerodynamically balanced and fitted only in the upper wing, were of mixed wood and metal construction. They were operated by a push-pull duralumin tube system in the lower wings connected to an interplane actuating struts terminating at a bell crank on each aileron.

Wing dimensions, as provided by the manufacturer, listed upper span as 34 ft. 8 in.; lower span, 29 ft. Upper chord was 5 ft. 6 in.; 4 ft. 8 in. Area, including ailerons totaled 296 sq. ft.

With its initial Model 1000 built and sold, Travel Air quickly produced the first Model 2000 in time to enter the 1925 Ford Reliability Tour. This contest was promoted by Ford primarily to show off early models of the old "Tin Goose". Winners in various categories

were determined on the basis of reliability of performance rather than any one single characteristic, such as speed. In its class, the Travel Air took first place with the greatest number of points. On the strength of this performance, Travel Air's business slowly began to pick up. But when Travel Air won the 1926 Ford tour, the old planning mill in Wichita literally busted its breaches.

Moving to new quarters in the same city, the firm produced 46 airplanes in 1926, expanded sales and production to 154 ships in 1927, and really boomed to 530 planes in 1928. By the end of 1928, the company had contracts for $2 million worth of additional aircraft! Late in 1928, the firm reorganized to become simply the Travel Air Company, still headed by Walter Beech, in order to better handle the unfilled orders which by then included four and six passenger cabin monoplanes in addition to the biplanes.

From time to time the designers of the Travel Air 2000 have been accused of attempting to "copy" the Fokker D.VII. In a way, the 2000 did resemble the German pursuit of W. W. I fame, particularly in certain flight attitudes. An engineering and aerodynamic analysis of the 2000, however, would show little actual similarity. The broad resemblance, however, did give the 2000 a unique chapter in its history.

That accurred when, in the late 1920's, Howard Hughes was filming that aviation classic, "Hell's Angels". Four or five genuine Fokker D.VII's had been obtained by Hughes to lend authenticity to the film's portrayal of a German squadron of 1918. But to build a full squadron of ships that "looked like D.VII's", he acquired a number of Travel Air biplanes, mostly Model 3000 (Hispano powered) that, when painted to match the real D.VII's, could have fooled all but the most expert movie-goer.

As a result, the 2000 and 3000 acquired the nick-name "Wichita Fokker". Maneuvering with a real D.VII, famous for its outstanding aerobatic ability, was satisfactorily accomplished by the Travel Airs. This performance led to the Travel Air's general acceptance and wide use for several years thereafter as a standard ship for aerobatics, not only by movie companies but by stunt pilots as well.

Perhaps the final curtain on the Travel Air's movie performance came shortly before W. W. II when "Men With Wings" was produced. At that time only one of the "Hell's Angels" original Fokkers was left, but Travel Air 2000 and 3000 models were hired by Paramount from private owners, decorated to look like the real thing. Most Travel Airs for this production were fitted with fake D.VII radiators in place of the standard spinnered nose to achieve the fullest effect.

In final cutting of the film, however, most of the footage showing those ships in action remained on the floor.

A few of the old Travel Air biplanes still are left and can be seen today. If you should find one, remember that it is a design now nearly 30 years old. Indirectly, it helped produce other and perhaps even better designs; not that it was copied, but it inspired designers to evolve types more efficient and more saleable.

International Power Contest

(Continued from page 13)

last year; these two theories, from the point of view of performances attained, have equal merits. The first is well known to Americans, having been imported to Europe from America. It advocates building a compact model, rocketing to the sky to very high altitudes. Every effort is concentrated on the ascent, on the power flight. As to the second theory, developed in Switzerland, it is based on the principle that the power model, according to the FAI rules, must above all be a glider. Accordingly, its model possesses a large wing area, the profile of an excellent glider, a long, aerodynamical body, with an important wing elongation. Of course, such a model will not fly as high as the former one, but it will have much better gliding qualities. Which theory is best? Nobody knows.

In Paris, a Swiss, Gerhard Schmid, won with a motor glider, while in Zurich a model of the American type ranked first. However, I believe that a revolution is on its way now as far as the building of model planes is concerned, such a revolution being the result of the new FAI regulations, to which the Swiss have adapted themselves with an easiness which seems to be in contradiction with their traditionally conservative disposition of mind. The supporters of the Swiss theory have in fact a weighty argument, that of having won

the first two places in Paris, and in Zurich, the second and fourth places with the same type of model, which is really an accomplishment!

The reappearance of German model fliers was hailed with a certain pleasure. They ranked second in the classification by nations. Their models, very well built, were characterized by the regularity of their flight.

I leave it to my readers to interpret the results given below, showing the classification for each run, and the general classification. I would, however, like to give the following details; they are interesting and could lead to fruitful reflections. On the first round, the German Lange was 22nd (151.5 seconds), the Swiss Maret being first with 300 seconds (maximum), and Wheeler fifth with 209.4 seconds. On the second round, Maret broke his model after a flight of 17.2 seconds, thus losing all his chances, while Lange took the second place with a maximum flight of 300 seconds, Wheeler already being first with a flight of 298.2 seconds. The Englishman then totalled 507.6 seconds as against 451.5 for the German. The struggle was going to be a hot one between these two contestants when, against all odds, the German, not using the thermals as the ten first contestants had done, went back to the seventh place, leaving an easy first place to the Englishman.

In conclusion let us hope that American model fans will send a team over to England in 1953—it is in this country that the contest will be organized—and that they will in this way manifest their interest for this international contest, which certainly deserves world participation. I am sure it will be possible to find in the U. S. five model fliers who would be delighted to cross the Atlantic; or am I wrong in this?

FAlson

(Continued from page 18)

horizontal keel (1/8" sheet), then formers, gussets and firewall. Next, landing gear is bent of 3/32 wire, and mounted in a piece of 3/32" I.D. brass tubing at fuselage end, and a washer is soldered on the gear to hold tubing in place. The tubing is then bound to a block of balsa with heavy thread, and the block is heavily cemented to rear face of firewall. A rubber band is used to tension the gear, and is attached to the gear with a loop of thin music wire. The other end of the band is secured to fuselage. A wheel of about 1-1/2" diameter completes landing gear. The author has found that "custom fitting" gear to ship is better than bending to prefixed dimensions and angles. Just keep in mind the facts that you want about five inches from thrust-line to ground in three-point attitude, and that in retracted position, the gear should serve as a landing skid. Now, mount the engine, and plank the nose from rear frame forward with 1/8" balsa. Use plenty of cement; the planking carries the stresses around the wheel-well. Build cowling of sheets and blocks, and fair to shape around a spinner of about 1-1/2" diameter. Slot needle valve for operation with a screw driver. Next, cut away just enough planking to allow landing gear to retract completely, and sand complete fuselage thoroughly. *After* sanding is completed cut intake and exhaust openings as shown in photos, and mount wing and tail platforms and rudder. Next, carefully cut out a piece of planking large enough to allow installation of a tank and your favorite fuel shut-off system, then replace the removed planking and sand lightly. The author favors flying smaller engines on visual fuel allotment (clear tank), because of frequent malfunctions of mechanical fuel shut-offs when used with small engines. At any rate, if you use a shut-off, use a tank small enough to limit your maximum engine run to about 30 or 40 seconds in case of a malfunction.

The "built up" ribs employed in the wing,

believe it or not, allow faster and easier construction than conventional sheet-balsa type, particularly with a tapered wing. Strength is much better, too, since the mass of ribs is concentrated in the outer fibers. You simply make one wing-rib template, and using it as a guide, slice all upper ribs "indoor style" from medium 3/16" sheet balsa. Slide the guide down 1/8" after each slice, and you end up with a rib of 3/16" x 1/8" cross-section. Build wing as follows: pin down leading and trailing edges, and cement in lower ribs (medium 1/8" x 1/4" balsa laid flat). Next, cement spars to lower ribs. Then, come in and fit upper ribs by cutting them off at trailing edge. Cement upper ribs to leading edge, both spars, and trailing edge. The false ribs are cut, using forward end of rib-template as a guide, and are cemented to leading edge and front spar. Note that the trailing edge of the tip panel is laminated of soft 3/16" x 3/16" balsa, moistened to allow curvature. You will find that building one wing half on the other, bottom to bottom, is better than reversing plan. When panels are dry, assemble the wing with 1-1/2" dihedral at both outboard breaks, and seven inches at both tips. Add all butt-plates and gussets, check all cement joints, sand.

The stabilizer is built in same manner as wing, using one stabilizer-rib template for all ribs. Note that the slot at the root of the stabilizer extends from front spar to trailing edge. Sand slot until it clears sides of rudder. Using a fixed rudder with a "pop-up" stab assures rudder alignment every time the model is assembled, and the rudder provides a positive stop for the stab in the dethermalized position. The sub-rudders are faired to a streamlined section, and thoroughly cemented to both spars and a rib of the stabilizer.

The fuselage should be covered with *Silkspan* (or *Skysail*). Cover all planking and cowling with wet *Silkspan*. Covering the planking is very important from a strength standpoint, as well as for durability of finish. Give complete fuselage one coat of dope, then cover the portion from planking aft with Jap tissue; this double-covering prevents rips, and adds to the torsional rigidity of the structure. Cover wing, stab and rudders with Jap tissue.

Apply six coats of clear dope to entire ship, sanding lightly between coats. Trim model with colored dope, then apply one coat of fuel proofer or one coat of Buterate Dope, to fuel proof entire ship. The author's model is red with silver trim. Select colors good for visibility. Cement plastic canopy to center section of wing (this is necessary to meet FAI cross-section requirement), install an 8-6 or a 9-4 prop and the ship is complete. Assemble model and check center-of-gravity location. Make corrections with clay. Bring model up to weight (again using clay, either inside the spinner or inside nose planking), and you're ready for test flying.

Raise left tip of stabilizer 1/2" (looking from the rear). If you have no warps, the model should glide very flat in a medium-sized left-hand circle. Make any incidence adjustments necessary at the tail. If circle is more than 150 feet in diameter, tilt stab more. If circle is less than 100 feet in diameter, warp rudder to right.

First powered flights should be made with engine as rich as possible. The model should climb in a very large left-hand circle, or even straight ahead, and should show no tendency toward looping, because of the generous downthrust. If ship tends to drop the left tip too much under power, try using a little modelling clay in right hand wingtip. By varying amounts of rudder offset and stab tilt, any combination of climb and glide can be obtained. Rudder offset has more effect under power, and stab tilt has more effect on glide—keep these facts in mind. Under full power, the ship should break ground in about 20 feet, and climb fast at about a 30 degree angle. END

Zilch X

(Continued from page 14)

youngster at the time, was given one and had it in the air in very short order. The lad handled it very well and started practicing the pattern in earnest. Dennis won the International Jr. Stunt Championship and has a flock of other wins on his score card. We're not saying the ship did it for him, but we like to think it helped.

Fuselage: Taper a 3/16" sq. piece of balsa and cement rear of fuselage sides to it. Construction is very similar to *Wee Duper* in M.A.N. (April '51). Line up sides. Hold this in place with a few pins or clothespins, making sure flare out is wide enough to take front firewall; allow to dry. Add front and second plywood bulkheads with motor mounts in place, aligning them properly. Work cement in around motor mounts and firewall. Add 3/32" sheet bottom. Fit 1/8" sheet re-enforcements in place at rear top and bottom as shown and cement well. Add 1/8" square balsa braces as shown to bottom and sides of fuselage. Sand this whole unit very well, being careful not to sand top sides of the fuse where top forming block fits; add one coat of sanding sealer. Silk fuselage at this stage, applying only two thin coats of dope to covering. Draw rib section, using template, on sides of fuselage in correct position, making sure that measurements down from top of fuselage to center of leading and trailing edge are correct. Do this on both sides so wing will be in correct position when it is slid into place. Now start wing.

Wing: Slide all ribs onto main spar, including sub-spar in operation. Build up edges according to material sizes on plan. The 3/8" x 7/8" piece can be cut down from 1" wide stock. Add leading and trailing edges, making sure everything lines up; also that center two ribs are slanted back as shown. Apply cement to all necessary joints, being sure to use a sufficient amount. Allow to dry thoroughly, then check for any warps. Add reinforcing plywood at each side of center section at bell crank point. Drill hole for crank. Lightly sand all rib joints at leading and trailing edge until they fit smoothly. Round out leading edge to proper shape, then smooth out trailing edge. Don't sand rear of trailing edge to a sharp point, but leave it about 1/16" thick. Trim two end ribs down 1/8" on each side and shape to leading and trailing edge. Form tips and sand to shape, then hollow out. These should be very light. If one is slightly heavier, use it on outboard side of wing. Cement tips into position so they fit end ribs exactly.

Install bell crank. The aft ear is bent slightly down as shown so it will clear pushrod. Lightly mark path of bellcrank wires on top of wing-ribs so sharpened piece of 1/8" piano wire (which we use to push lead out wire holes through ribs) will line up exactly with holes in bell crank. Add wingtip tubing for leadouts. Install leadout wires and attach to bell crank. Work crank back and forth, checking to see where leadouts drag on any part of ribs. Clear all noted places. It is very important to have no bind at all on any control point. Now add 3/32" sheet planking to each side of center section of wing and sand whole assembly until very smooth. Wing is now ready to cover. Cover wing with dyed silk, then dope. Dope half a wing on each side as you gradually fill in. Be sure to apply enough dope so you can press your lips to silk and blow, yet not blow through the silked areas. Trim out top of wing, as shown, for push-rod clearance. When wing is completely doped, cut outlines of rib section on each side of fuselage and fit wing into position. Make sure wing is zeroed out perfectly by measuring down from flat part of fuselage, as noted, to center of leading and trailing edges. Misalignment here would be disastrous. Check to see that wing is in squarely all around. Now run a bead of cement around outside of wing where it joins fuselage and rub this in. When this operation has been done, check alignment once again, then allow to dry. Add two more beads of cement to outer side and fillet in.

Install landing gear as shown, then add tank, being careful to trim out a square where breather vents extend from fuselage. When tank is securely cemented and braced, fit square back into position. Make horizontal stabilizer and elevators as shown and sand thoroughly. Cement elevators and hardwood elevator spar into position and sand to fit smoothly. Add control horn, cement, and wrap with thread. Apply three light coats of sanding sealer and sand again with fine sandpaper. Now add elevator hinges as shown. Pre-doped linen is very good here. Apply dyed silk to this assembly and dope lightly. Add one medium coat of sealer over silk and then dope until smooth. Cement this assembly into position as shown and connect push rod. Put dowels in place as per plans.

Work controls as they have to be very free. Shape and hollow out top block as shown and put into place, Sand to shape and add cockpit hole. Cover this with silk after a few coats of sealer. Make rudder and cover with silk as the tail section. Slot top block at rear of fuselage and rudder. Fillet cement in around rudder. Attach to lower part of fuselage, at the rear, with cement and fare in. A piece of linen lapped over this joint helps. Lap about a half inch piece of linen from underside of horizontal stab to fuselage and dope thoroughly. Add headrest and cover with silk. Smooth out all contours and thinly but thoroughly dope whole model again, or as many times as necessary. Block out engine cowling per plans and sand to shape. Sand smooth and apply silk, then sealer, and dope again until smooth. Paint and trim ship to your own specs. If you don't want to use regular fuel proofer, a sprayed coat of Buterate dope works very well. Engine size recommended: .29 to .49. Fly on 60' lines (twelve thousandths).

Planes in the News

(Continued from page 20)

also said that the option for seven additional *Comets* would probably not be used if any U. S. outfit did come up with a jet transport before 1957.

Routes are not specified, but expectations are that PAA will run the *Comets* in competition with the Venezuelan airline, LAV, which has two *Comet* Series 2 aircraft on order. LAV runs New York to Buenos Aires.

The *Comet 3*, as delivered to PAA, will be a convertible craft, usable from a 58-seat first-class version to a 78-passenger coach. Range is guaranteed at 2,700 miles against a 50-mph. headwind; reserves of fuel over and above this provide for an alternate 200 mi. distant after 45 min. in the stack.

The total fuel load to do this will be 9,700 gallons carried in internal wing tanks and in external fixed tanks like engine nacelles about two-thirds out along the span. These will be the recognition trademark of the *Comet 3*, along with the longer fuselage. Otherwise the plane will remain just about the same as the original layout—sleek and lovely and pioneering.

▸ *The By-Pass Engine* — Roll-Royce recently added a new word to jet engine terminology when it announced the *Conway*, a by-pass engine. The original statement was rather vague and ambigous—perhaps purposely, because the by-pass engine is still heavily shrouded in secrecy—and left much to the imagination. Actually, the by-pass engine does what the name says—it by-passes some of the air around the engine instead of passing it through the complete cycle.

Just inside the air inlet of the standard turbojet is a low-pressure compressor. It resembles a many-bladed, stubby-bladed propeller. Behind that compressor the air is split. Most of the air goes through a second com-

pressor with high-pressure capabilities, then to the burners and out through a turbine in the usual fashion. But the rest of the air is fed around the outside of the engine to mix with the primary air in the exhaust blast.

At first blush it seems rather strange to go to all the trouble of getting air in and then letting it go right out again without doing much to it. But there is a good reason—several, in fact.

The by-pass engine was evolved as an answer to the problem of turbojet fuel consumption at moderate speeds, such as you want for jet transports and long-range bombers. It so happens that the overall efficiency of any jet propulsion device is measured in terms of the exhaust speed and the speed of flight. The closer these are, the more efficient the process.

Now, a turbojet normally exhausts in the neighborhood of 1,000 mph. For transport speeds, this means efficiencies under 40%; for the faster fighters, this figure improves considerably.

How do you slow down a turbojet exhaust? Well, you can cool it off, and make it a little denser in the process. You can add in some extra air at a slower speed to cool and reduce speed of the mixture in one process. And that's what the by-pass air does. It mixes with the hot exhaust stream of the turbojet portion and dilutes it; the mixture slows down and the temperature drops. Efficiency goes up.

So the by-pass engine is going to be used more and more in the long-range aircraft of tomorrow. Rolls-Royce has pioneered the type in large jets, although there have been earlier and successful units on a test basis.

▸ Waiting to fly a research aircraft is not recommended for impatient people. Take the Douglas *X-3* or the *Bell X-2* as examples.

The latter has been waiting on its Curtiss rocket engine— admittedly one of the toughest design problems tackled in years—for some time now. Parts have shuttled back and forth between Bell and Curtiss, and at this writing, continue to do so. The plane has been called the world's heaviest steel glider, in laughing tribute to its uninstalled rocket engine.

But look at it this way: The job given to Curtiss was to design a rocket motor that could be throttled from full to low power easily and smoothly. That had never been done before in anybody's rocket engine, and most rocket experts were of the opinion that it couldn't be done. Well, it's being done, but it takes time.

When Curtiss completes its job, it will have found one answer to the biggest current problem in the application of rockets to military aircraft. And for that alone, they deserve all credit.

Douglas has had its *X-3* ready for flight for some time now, but there have been engine difficulties there also. Early reports on the plane stated that the powerplant was to combine a turbojet with a ramjet—not in the same package—but more recent comments name the powerplant as a pair of Westinghouse *J40* turbojets.

The *X-3* did finally fly recently—I'd guess about one year behind schedule—but no results are available at this time. Bill Bridgeman, pilot of Douglas' *Skyrocket* which holds the world altitude and speed records, is handling the *X-3*. Original specs called for speeds of Mach 2 or 3 and altitudes of better than 100,000 ft. Sounds good, doesn't it?

Production orders have been placed within recent weeks for three new fighters for the USAF—the North American *F-100*, McDonnell *F-101* and the Convair *F-102*. Sources close to the Pentagon expect that these will soon be joined by a fourth, the Republic *F-103*. Biggest difference between the *F-100* (which used to be called *Sabre 45*) and its predecessor, NAA's *F-86*, will be in the increased sweep angle of the wings. They will rake back at 45 deg. instead of the 35-degree value of the earlier *Sabres*.

For power, the new craft will use the big

Pratt & Whitney *J57* turbojet, rated enthusiastically and unofficially at 15,000 lb. thrust with afterburner. The bigger engine and additional fuel requirements mean more airplane to carry them, and the *F-100* is expected to top 20,000 lb. with no trouble, compared to the light, 16,000-lb. *Sabre*. New armament, with a heavier punch than six fifties, will be provided, although the exact nature is unspecified. Want to bet on air-to-air rockets?

Production of the *F-100* will be concentrated at NAA's Los Angeles plant.

▶ *Bits and Pieces* — McDonnell's red-hot *Demon*, the *F3H*, is going into production at a second location: Temco Aircraft Corp., Dallas . . . The Toyo Aircraft Co. of Japan will build the Fletcher *FD-25* tactical support single-seater. It will be the first plane manufactured in Japan since the end of the war . . . Piasecki's big, new *XH-16* copter will be about ready to fly as you read this. The family resemblance is there, but the size far outstrips anything Piasecki—or any other manufacturer of real helicopters—has built yet . . . Douglas *XA3D-1* made its first flight about the first of November at Edwards AFB. The twin-jet sweptwing craft was aloft for half an hour . . . A Dassault *Mystere 2* exceeded the speed of sound during a familiarization flight by USAF Major John M. Davis. It was the first French aircraft to do so. About a week later, Col. Constantin Rozanoff, Dessault test pilot, demonstrated the *Mystere 4*, a souped-up, thinned-down version of the *Mystere 2*. Rozanoff made a blistering flypast close to 700 mph. at an altitude of 65 ft. Yes, 65 ft. And having met the man, that might be estimating his altitude a little on the high side . . . Howard Hughes' *H-17*, twin gas-turbine pressure jet helicopter, made it off the ground on its first official flight recently. Douglas *F4D Skyray* is probably the hottest thing the Navy's got right now. Its early flight tests with an Allison *J35* turbojet fitted have been impressive, in spite of the fact that the plane is underpowered. Just wait until it gets the Westinghouse *J40* which is supposed to do the job!

AMA News

(Continued from page 37)

planform; overall fuselage length of 52" and cross-section of 10.25 sq. ins. A single wheel retractable take-off gear is used. The 20"D x 27"P prop is powered by 18 strands of 1/4" brown rubber 62" long. The model weighed in at 8-1/4 ozs.

Free Flight Gas Models, R.O.G.-Type, Class Half-A Senior—30:00.0. Record established on August 17, 1952, by Douglas Campbell of South Bend, Ind., using a *Zeek* powered by a *Wasp* and a 5"D x 3"P Kaysun prop. The model weighed 6 ozs.

Free Flight Gas Models, R.O.G.-Type, Class Half-A Open—30:00.0. Record established on July 13, 1952, by William K. Johnke, Uniondale, L. I., N. Y., using a Half-A *Fubar* powered by a *Wasp*. The model weighed in at 6.2 ozs. and the prop used was a 5-1/2"D x 4"P Kaysun.

Free Flight Gas Models, R.O.G.-Type, Class B Open—30:00.0. Record established by Elmer J. Roth, Salem, Ore., on July 13, 1952. Model used was a 32-ounce *Powerhouse* 56 powered by a K & B .29. Prop used was a 11" Air-O-Flite.

Free Flight Gas Models, R.O.W., Class Half-A Junior—18:48.4. Record established by Bruce Tune, Los Angeles, Calif., on July 31, 1952, using a *Torp* .049 powered *Smarty* which weighed 6 ozs. and used a Top Flite 6"D x 3"P prop.

Free Flight Gas Models, R.O.W., Class Half-A Senior—16:36.0. Record established on July 31, 1952, by Bob Gelvin of Topeka, Kans. Bob's model, a *Wasp* powered *Zeek*, was weighed in at 5 ozs. Prop used was a 5-1/2"D x 3"P Kaysun.

Free Flight Gas Models, R.O.W., Class Half-A Open—13:31.0. Record established by Forest W. Allen, Los Angeles, Calif., on July 31, 1952, using a model of his own design. It has a wing with span of 37" x 4-5/8" chord, elevator with span of 16" x 4-5/18" chord, and 23-3/4" fuselage. A *Torp* .049 and 6"D x 3"P Tornado prop were used on the 5-ounce model.

Free Flight Gas Models, R.O.W., Class Half-A Open—17:02.0. Record established by James P. Taylor of Albuquerque, N. Mex., on October 12, 1952. The model, designed by Paul W. Callies and called *Privy Boy*, was powered by a Thimble Drone *Space Bug* and 6"D x 3"P Kaysun prop. It has a 36" x 5-1/2"

wing, 20" x 5" stab, and 27" fuselage.

Free Flight Gas Models, R.O.W., Class A Senior — 15:19.0. Record established by Edward R. Mate, Chicago, Ill., on July 31, 1952. Ed's model was a *Zeek,* powered by an Arden .199 and 9"D x 6"P Top Flite prop, which weighed 22 ozs.

Free Flight Gas Models, R.O.W., Class B Senior—10:56.6. Record established by James M. Coffin, Long Beach, Calif., on July 31, 1952, using his original design which is somewhat reminiscent of Ray Acord's *Champion.* The model has a 76" x 10-1/2" wing with NACA 6409 airfoil and 33% stabilizer. Fuselage length is 40". The model is powered by a *Torp* .29 with 10"D x 5"P Y & O prop. It weighed 41 ozs.

Free Flight Gas Models, R.O.W., Class B Open—19:38.6. Record established by Elmer Scaggs of Sheppard AFB, Tex., on July 31, 1952. The model was a scaled-up *Zeek* which weighed 40 ozs. and was powered by a *Torp* .29 with 10"D x 6"P Top Flite prop.

PAA Load Models, Class Half-A Junior—5:14.4. Record established by Greg Weissenberger of Los Angeles, Calif., on August 2, 1952. Greg's model was a *PAA Master* powered by a *Torp* .049 with 6"D x 3"P Tornado.

PAA Load Models, Class Half-A Senior—12:27.2. Record established by Roger L. Barron, Springfield, Va., on August 3, 1952. The model, designed by Roger with the exception of the *Fubar* 36 wing which was used, has a 25" overall fuselage length, cabin-pylon wing mount, rectangular elevator with 15" span by 5" chord, and twin rudders. A two wheel take-off gear was used and the model, less "occupant", weighed 6 ozs. The model was powered by a K & B .049 with 5-1/2"Dx4"P Kaysun.

PAA Load Models, Class Half-A Open — 26:09.0. Record established by Richard R. Sladek of San Diego, Calif., on August 2, 1952. Sladek's design, called *Pay-Up,* was powered by a *Wasp* and 5-1/2"D x 4"P Kaysun prop. The model has a wing with 46" span, 5-1/2" center chord, tapered tips, Gottingin 602 airfoil, and polyhedral; elevator with span of 18", 5-1/2" chord, and rectangular planform; 24" fuselage with cabin-pylon wing mount, single wheel take-off gear.

PAA Load Models, Class AB Junior — 6:01.2. Record established on August 3, 1952, by Hal Cover, Glendale, Calif., using his Arden .199 powered design and 10"D x 3-1/2"P Top Flite prop. The model has a wing with 58" span by 9" chord, elliptical tips, and polyhedral; rectangular elevator of 15" span by 7" chord; and 40" fuselage which, although only a little over 4" in fuselage height, is designed to give a similar set-up as a pylon job. This is accomplished by setting the wing and tail at negative angles in relation to a line drawn through the length of the fuselage.

PAA Load Models, Class AB Senior — 16:54.2. Record established by Clinton Merrill, Oildale, Calif., on August 3, 1952. Model used was an Arden .199 powered *Crowbar* of 444 sq. ins. wing area which was designed by Ray Matthews. Prop a 10"D x 3-1/2"P Top Flite.

PAA Load Models, Class AB Open — 23:53.4. Record established by Fran Uyematsu of Montebello, Calif., on August 3, 1952. Model used was a modified *Cumulus* which was powered by a *Torp* .19 and a 9"D x 6"P Power Prop.

PAA Clipper Cargo Models, Open—17.25 ounces. Record established by Robert E. Latham, Dallas, Tex., on August 3, 1952. The model, designed by Latham and powered by a *Wasp* and 5-1/2"D x 4"P Kaysun prop, has a wing with 60" span by 7" chord and undercambered section; stabilizer with 24" span by 6" chord; and deep bellied fuselage of 36" length. The fuselage is sort of a pod-boom affair with a high thrust line, two forward wheels, and a tail wheel.

Gas Models, Control Line Speed, Class A Open — 135.08 mph. Record established by George C. Mueller, Jr., Phoenix, Ariz., on

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July 14, 1952. The model, an original design powered by a K & B .19 with 6"D x 10"P Tornado prop, featured sheet aluminum wings with span of 12"; 12-1/2" overall fuselage length with metal half-pan manufactured by Friedland-Stiles and 1-3/16" spinner; and elevator with 6" span. The model weighed in at 10-1/2" ozs.

Gas Models, Control Line Speed, Class B Junior — 136.31 mph. Record established by Roger Welden of Rockford, Ill., on June 22, 1952. The model, designed by Roger Welden and Fraink Bailey, was powered by a Dooling .29 with 7"D x 11"P Rev-Up prop. It has a 14" wing span, 7-1/4" stabilizer, and fuselage length of 15", excluding the 1-1/2" diameter spinner.

Gas Models, Control Line Speed, Class C Open — 137.35 mhp. Record established by Jack Friedland, Oakland, Calif., on August 3, 1952. The model he used was the same design with which he holds the Class C Senior speed record and is powered by a McCoy .49 with 8-1/2"Dx11-1/2"P Tornado prop. The model weighs 23 ozs.

The Jaguar

(Continued from page 31)

Make stiff cardboard template A and B. Final carving is done in rounding off all corners to obtain contours as shown. Use sandpaper block with 1/0 garnet paper to sand down to proper place, then follow with 2/0 paper and #400 wet-or-dry. Carve balsa headlights separately from soft balsa 3/4" wide x 7/8" high x 2-1/2" long. Trick to this is to carve in profile view to fit the apron. Be sure to make a left and right one. Then trim headlight to follow cowl line in top view. Last, draw headlight diameter on front with compass and carve corners to proper place. Sandpaper with 2/0 and follow with #400 wet-or-dry. Cment them in place. Make balsa seat back from one piece of soft 3/8" sheet balsa by 2" high and 3-5/32" long. A soft pencil with dullpoint is used to score the seat for imitating leather seats. Carve drive-shaft transmission tunnel from a soft piece of 5/8" sq. by 2-7/8". It has a half-round top as seen in front view. This piece is hollowed out to 1/16" thickness with a gouge to fit over electric switch. Notch seat back to let tunnel extend through, then cement them. Make seat bottoms in one piece of soft balsa 11/16" high profile x 1-1/4" wide x 2-1/2" long. Then cut in half and cement one seat on each side of transmission tunnel. Dashboard is made from a piece of 3/16"x7/16"x1-9/16" sheet balsa in triangular end view. Cement in center of car, to back end of front cowl. Drop dash 1/16" below cowl top to allow room later in adding cockpit coaming. In place of temporary pins holding car bottom to front and rear balsa blocks, install four countersunk head wood screws 3/4" long as shown. Now remove four screws and bottom from car. Make firewall at this time from 1/16" sheet balsa. The *Jaguar XK 120* is available to buyers with a right hand or left hand steering wheel optional. A 3/16" dowel serves as steering post and is cemented in place as shown. A piece of 1/16" sheet balsa x 3/4" x 3-5/32" serves as slanting part between firewall and floor. Cement it to firewall only. Trim transmission tunnel to fit. Install front axle made of 1/4" diameter one piece brass or steel rod for a plain job on the electric powered model or gas powered model. A detail drawing shows an adjustable front wheel installation which is harder to make, but more realistic because it allows car to turn either way or run straight. We used simple straight axle. Cut about five or six strips of 1/2" wide .016 24st alum. alloy to mount simple axles at front and back. Tin can was used successfully here. Trick is to bend a strap over 1/4" axle in U-shape, then remove and bend back one side with pliers. Again, put strap on axle and wrap other side around until it meets. It is essential that these clamps axle tight. Drill 7/64" diameter holes through fittings and install with 4-40 machine screws and nuts, using washers on both sides. Thimble Drome treaded two inch diameter rubber tired wheels are exact scale. A couple of washers fill space between wheel and bottom. Their exact number will be determined by trying wheel in place. A piece of 3/4" sq. penny postcard with a slit from one side to hole, serves as spacer on inner side of wheel, while soldering outer washer is counter sunk and leaves no room for paper spacer. A careful soldering job will leave a blob of solder that fills out to fair in rest of wheel and look like a hub cap. Remove paper spacer by opening at slit. A couple drops of 3-in-1 oil supply lubricant. Next install electric motor. A piece of 1/16" I.D. rubber tube over shaft barely touches wheel, so another rubber tube 3/16" I.D. must be slipped over smaller one for good friction. Set electric motor on bottom and drill 1/8" holes to mount it, using four 4-40 m.s. and nuts, washers on each side. A piece of 1/16" x 7/8" x 3-5/32" plywood serves double purpose as floor and toggle switch mount. Secure switch in center of plywood and cut 7/16" x 1-1/8" hole in car bottom to set switch into. Now secure Hillcrest plastic battery box with a 4-40 m.s. and nut. The medium size tried on this model will work, but to make it run faster and longer, large "D" size batteries and box are better. Four pencells are good. Use wiring diagram and hook up units. Switch should be removed from car bottom while soldering. We fastened the ply floor with two 2-56 c' sunk machine screws and nuts, but this can be cemented if you do not intend to remove power installation. Now cut notch in top of transmission tunnel so toggle switch can stick through and move fore and aft freely. Before painting, remove motor, ignition and axles. Seats are given four coats Testors sanding sealer and painted yellow with Testors dope to imitate leather. Latter was sprayed after thinning with Testors thinner. Body is filled with seal-sure Sealer, brushed on, two coats at a time and sanding with 2/0, then #400. Our body was sprayed medium Blue Testors STA dope. After painting, re-install electric unit, axles, seat and attach body to bottom with four wood screws. Add final trims such as aluminum disc for headlights, aluminum bumpers held on with straight pins and the tube bushings, grill made of soft 1/32" wire and painted silver, cemented in place. A foot of 1/16" I.D. rubber fuel line, split in half and attached to edge of cockpit with pins, makes a realistic coaming. Silver paper with instruments drawn in India ink makes dashboard complete. A Hillcrest 1-1/8" dia. plastic steering wheel, painted white, is attached to steering post with a pin. Make the one-piece celluloid windshield and stick scotch tape around all edges to represent chrome. Testors Cement was used in doing this so as not to hurt paint. As the *Jaguar* looks better without its optional rear wheel cover, it was omitted as is done when raced. Also omitted are tail and parking lights, which detract from appearance. A note about gas motor installation: use from .049 to .09 cubic inch motors and mount as shown. Large hole in wheel can be filled with a bushing, similar to one used on Arden .09 prop shaft. Stub axle is 1/4" dia. steel and 1-11/16" long, attached with the same type clips on long axle; they are mounted on front side to make room for fuel tank. Straps for attaching bridle are shown; note how high outer end comes. This is to get c.g. under this point and cause inner drive wheel to ride on ground. The apex of your wire bridle should be opposite c.g. or perhaps 1/4" to rear. This will keep nose pointer out. Stranded wire of 50 lb. pull and 15 ft. long is used for tether. Starting is done by holding drive wheel against bicycle wheel or electric starter. There should be a slot for exhaust in bottom and another for reaching glow-plug. The seat in front of motor is removed when running for cooling motor.

END

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The Radio Units and Kits presented here have each been re-designed three or more times. This permits us to offer you a time-tested, yet timely product. We prefer this to meaningless sensationalism in our advertising.
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Contest proven in both Radio and PAA-Load events, this rugged model is easy to build, adjust, and fly. Designed by Henry Struck, pre-fabricated kit includes complete Radio Control and PAA-Load installation drawings.
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For .035 to .099 Engines — 38" Wingspan
So many model builders converted the old Brigadier "38" kits into Radio jobs, we have now re-designed the kit especially for Radio Control or PAA-Load flying. Plans include Radio installation details. Die-cut parts.
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• Light in Weight, 2¾ oz. less batteries.
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Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.
Kit (less tube) ... $13.95
Crystal-Controlled Super Aerotrol TRANSMITTER
• Completely portable — Self contained — No separate antenna — No external Batteries! • Operates on 27.255 mc. • Weighs 3.5 lbs.
Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included —
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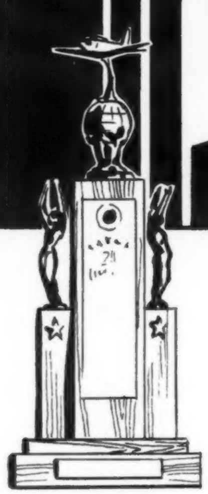

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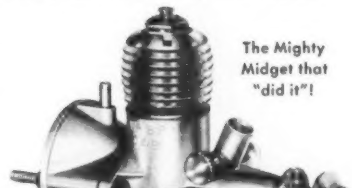

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